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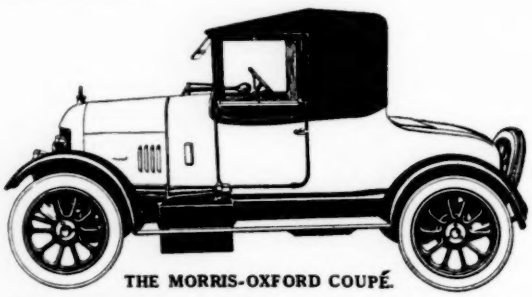

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Annual Oration

ON

CERTAIN MINOR INJURIES OF THE BRAIN.

Delivered before the Medical Society of London on May 5th, 1924,

BY WILFRED TROTTER, M.S. LOND., F.R.C.S. ENG.,

SURGEON AND HOLME LECTURER IN CLINICAL SURGERY, UNIVERSITY COLLEGE HOSPITAL, LONDON.

THE choice of this subject has been guided by two considerations. In the first place, the unity of structure which is so characteristic a feature of our Society, seemed to point towards some topic of which the interest is not limited to any special department of medicine. In the second place, the occasion appeared to be one, if I rightly interpret its tradition, in which a very close restriction to technical matters need not be insisted on; while if the subject chosen developed naturally towards regions outside the strictly medical field, some glance into such wider sources of interest might be, in the circumstances, legitimate.

INTRODUCTORY.

It will, I think, be admitted that the subject of head injuries is of practical interest and importance to the great majority of us, whether our work lies exclusively or chiefly in a special department of medicine, or is distributed over all. It is, however, only to a very much limited part of this large subject that I propose to invoke your attention. My primary object will be not the gross and at the same time relatively definite conditions that we meet with in immediate consequence of obviously formidable accidents, but the conditions at first sight relatively indefinite, and not obviously serious, which occur as late results or sequels to head injuries of all grades of severity. It will be convenient at once to define our subject yet more exactly. We are to consider a group of phenomena, including headache, giddiness, and other less definable sensations in the head, defects of memory, concentration and attention, alterations of disposition and mood, and certain kinds of mental deterioration. This group of phenomena is to interest us when arising after and in obvious consequence to a head injury. It will not be necessary to deal with each member of the group, as the single one of headache can be selected as the most characteristic and as fully representative of the others. What can be said of headache, the commonest of them, can be said with all reasonable probability of most, if not all, of the others. We have now pruned down our subject until it is adequately represented by that of headache as a sequel of head injury. There remains, however, one further stage of definition to be accomplished. Headache, and others of the associated group of symptoms, is common as a sequel to head injuries of all grades of severity, and bears no obvious relation to the amount of gross destructive damage that has been inflicted. In considering its significance here, therefore, it will simplify the problem if we limit ourselves to headache occurring as the sequel of head injuries of minor severity, and without evidence of local damage to the brain, either through destructive injury or in consequence of hæmorrhage. It might be thought that these restrictions of our subject have reduced it to insignificance. This is, however, far from being the case, and it is often of the utmost practical importance to recognise the fact that seriously disabling headache is a common sequel to head injuries of an apparently minor kind, in which evidence of any direct local injury of the brain has been altogether lacking.

We have, then, ultimately before us the subject of serious headache as a sequel of apparently slight or trivial head injury.

HEADACHE AS A SEQUEL OF MINOR HEAD INJURY.

It is quite a mistake to suppose that the conditions we are considering are clinically indefinite and difficult to recognise. In well-marked cases one of the most fully characteristic of clinical pictures is produced.

The Causal Injury.—There are two types of accident which fulfil the conditions we have laid down. Both are fairly common, of quite moderate severity, and seem at the time of infliction to have caused no definite or severe cerebral injury. In fact, the mildness of the whole affair often causes both patient and doctor, if one is consulted, to congratulate themselves on no harm having been done, and to ignore the necessity for precautionary treatment.

In one type the accident is a fall on the head, as, for example, from a horse. The patient develops slight concussion of the brain: there is momentary unconsciousness which is quickly recovered from, and followed by dizziness and headache, which clear up in a comparatively few hours. I may say at once that I use the term concussion, as I think it should only be used in the strict classical sense to indicate an essentially transient state due to head injury which is of instantaneous onset, manifests widespread symptoms of a purely paralytic kind, does not as such comprise any evidence of structural cerebral injury, and is always followed by amnesia for the actual moment of the accident.

In the second type of injury the violence is characteristically limited to a localised area of the skull. This may be produced by the patient accidentally running against some obstacle, by a blow from such a weapon as a stick or sword, or by the grazing impact of a bullet. In these cases concussion is characteristically absent; there is no loss of consciousness, and the patient retains a clear memory of the moment in which the injury was received. If the blow was over some part of the brain slight functional disturbances in which are capable of being manifested in symptoms, there may be transient numbness and tingling in the corresponding limb, or clumsiness in the use of it. Such phenomena are not relevant to the limited subject we are considering, and perfectly characteristic cases of traumatic headache commonly occur without them.

We have, then, a patient who has sustained one or other of these accidents. He has been shaken and is in some discomfort for a few hours or even a day or two, but has already begun to feel that, ugly as the affair seemed at the moment, no harm has been done, and then he begins to suffer from headaches.

As I have already said, I take headache as a representative symptom, ignoring for our present purpose the constellation of minor manifestations of which it is undoubtedly the most important and outstanding figure. It is necessary now to define the clinical characters of these headaches.

CLINICAL CHARACTERS OF TRAUMATIC HEADACHE.

Onset.—If headache has been a well-marked immediate consequence of the injury it may be continued into the sequelar headache we are considering. If the patient has been laid up as the result of the injury, the headache is apt to come on when he resumes active life. In any case it is often a week or two before the patient realises that he is faced with a distressing and disabling trouble that shows no tendency to early spontaneous recovery.

Occurrence.—It is usual and almost characteristic for the headache to occur in attacks which last for periods varying from a few hours even to two or three days. Between attacks the patient may feel absolutely well in every way. The attacks are apt to be brought on by physical exertion severe or prolonged, or by mental excitement anxiety or fatigue, and by such combined influences as walking in bright sunlight, or in crowded streets, and the many not always obviously exacting activities of town life.

Quality of the Headache.—The pain is of a severe throbbing, bursting character. Like that of migraine it is made worse by any effort, and by bright light

or loud noise. It may prevent the patient from sleeping, but like many other kinds of headache is often brought to an end by prolonged sound sleep. During the attack the patient is usually restless, intolerant of company or of any kind of attention, and irritable. In severe cases there may be during the attack almost maniacal irritability and sometimes a semi-delirious excitement. The severest attacks do not usually last more than a couple of days.

Results of Physical Examination.—It is possible, and indeed quite common, for these symptoms to occur without there being any physical signs of definite brain injury, such as even the minor grades of sensory disturbance of cortical type, defects of finer motor coördination, or alteration of reflexes. There is, of course, nothing in the nature of the cases to prevent such a severe grade of injury being present as would produce these signs, but I wish to put emphasis on the statement that many cases of the typical headache are met with in which no physical evidence of brain injury is to be made out.

PATHOLOGY OF TRAUMATIC HEADACHE.

It has sometimes been supposed that these symptoms are due to a psycho-neurosis determined by the injury. Such an opinion has found support, in the total absence of objectively discoverable evidence of cerebral injury, in the fact that the symptoms tend to subside under rest and easy conditions and to be aggravated on the resumption of active life, and in the supposed fact that head injuries are particularly apt to lead to the so-called traumatic neuroses.

I need not criticise this hypothesis, as I shall immediately be setting before you what I regard as a definitely established organic pathology; but I may pause a moment to remark on the conception that traumatic neuroses are especially likely to follow head injuries. It seems probable that an injury is related to the neurosis it determines, as a painful and terrifying experience, the memory of which does not lapse in the normal way but becomes associated with other unassimilated memories and repressed impulses. It is clear, therefore, that the survival of an actual memory of the accident is an essential factor in the production of a neurosis. Now in a large proportion of cases of head injury (including a considerable number of the special group of cases we are considering) the onset is with concussion, and therefore, since a localised absolute amnesia for the accident is always produced by concussion of the classical type, there is no memory at all of the occurrence of the injury. This conclusion is supported by actual clinical experience, which thus confirms the view implied above, that the concussion amnesia is a true organic absence of memory caused by cerebral disturbance.

There can be little doubt, however, that these traumatic headaches are due to definite organic disturbance within the skull. The immediate pathology of headache in general, by which I mean the actual mechanism by which it is produced, has not been the subject of very much attention, though the facts available admit of a reasonably probable sketch being made. In the first place, there is no reason to suppose that disease or injury of the brain itself can be the immediate cause of headache, in the strict sense of the term. As with other serous cavities, the contained organ itself is relatively, if not absolutely, insensitive, and pain can be aroused only by disturbances of the lining membrane and its septa. As with other serous membranes, also, it is probable that the most effective pain-producing stimulus is stretching. Now the arrangement of the dural septa is such that variations in the amount of intracranial pressure and inequalities in its distribution tell on them by causing alterations in tension. Thus it comes about that headache of organic origin is a direct expression of disturbances of intracranial pressure however these may be produced. Such a conclusion is in obvious agreement with clinical experience. It is probable that in nature a reduction in intracranial pressure is but rarely the cause of headache. It is plain, however, from the arrangement of the dural septa, that a local reduction in pressure can give rise to painful stretching until the disturbance has become equalised. This, of course, is the mechanism by which is produced the headache that often follows the withdrawal of fluid by a lumbar puncture.

When a disturbance of intracranial pressure is severe or rapidly progressive the consequent headache is continuous. When the disturbance is moderate, and either stationary or only slowly progressive, the headache is apt to be only paroxysmal. This latter is the case with a certain number of slow-growing cerebral tumours in their early stages, and as we have seen is almost characteristic of traumatic headaches. As to the nature of the disturbance in the case of traumatic headaches, we have a large body of direct evidence observed at operations. On such occasions there is always some increase in the intracranial tension, but usually this is only moderate in amount, since an operation is not likely to be undertaken during the actual course of an attack. This increase of tension is associated with one or other of two conditions of the brain itself. In cases where the headache has followed an injury causing concussion, the brain is œdematous and exudes an undue amount of fluid when exposed. In cases where the headache has followed a localised blow on the head, and the region struck has been explored, the brain shows by its swelling and blood-staining that it is the seat of a localised bruising. It is highly probable, therefore, that in both cases the increase of intracranial tension is due to the brain being swollen as the result of bruising; in one type of case, probably throughout its substance, in the other type chiefly, at any rate, at the point struck. If it be granted as reasonable to ascribe traumatic headache to a disturbed intracranial tension consequent on bruising of the brain, three points yet remain somewhat obscure and in need of discussion. These are the long persistence of the symptoms, the intermittence of the symptoms, and the mechanism by which the bruising of the brain is produced.

Persistence of Cerebral Contusions.

Traumatic headaches are notoriously capable of persisting for many years, and a difficulty at once presents itself in supposing them to be due to a mere bruise of the brain. This difficulty can be met only by the recognition of a very important and perhaps the only really special principle of intracranial pathology. This principle is concerned with the unique status of the brain as the one organ in the body enclosed by a capsule which is wholly inextensible by any physiological force. When any other organ is contused and its substance distended by extravasated blood, it can swell as a whole practically without limit, so that its circulation can be liberated from embarrassment by pressure, and the effused blood carried away relatively soon. Again, it is possible for such an organ only very slowly, or perhaps never, to regain exactly its normal size, and yet in no way to be for this reason a cause of symptoms.

Neither of these possibilities is open in the case of the brain. Enclosed within its inextensible capsule, the skull, the organ can undergo compensatory swelling only to a strictly limited extent. The result is that the circulation through a contused area remains embarrassed by the extravasated material present in it, and resolution by absorption of the bruise is indefinitely prolonged. It is surprising how long after the injury the signs of contusion will remain evident in the injured area. I have myself exposed by operation an area of brain that had been bruised by the glancing contact of a bullet with the skull no less than four years earlier. The brain showed a bruise that appeared as fresh as if it had been inflicted within a few weeks. This inordinate and unique delay in the resolution of contusions is fully adequate to account for the striking persistence of traumatic headaches.

Intermittence of Symptoms.

Although the skull encapsules the brain with a certain closeness, it does not do so so closely but

what a margin of accommodation is left, which permits freely of the variations in the size of the brain due to the circulatory mechanism. An encroaching lesion, therefore, such as an early tumour or a moderate contusion, may have its effects, as it were, contained entirely within this marginal space as long as the circulatory movements are tranquil and small. The moment, however, that such movement becomes active, the fact that the intracranial space is actually encroached upon becomes manifest in an evident elevation of the intracranial pressure and consequent symptoms. Patients at such a stage often observe that every repetition of an act like stooping, which, of course, raises the venous pressure and expands the brain, causes a momentary qualm of dizziness and headache. Along such lines as these are to be explained the intermissions in the symptoms of unresolved contusions without improvement in the actual condition itself, and the mode of action of the various causes that precipitate the attacks.

Mechanism by which Cerebral Contusions are Produced.

We have spoken of the complete rigidity of the skull in relation to forces of physiological magnitude. We must now turn to its entirely different behaviour in relation to forces of another order. It seems natural to think of the skull as a very strong shield and enclosure of the brain, which yields only to extreme violence, and only when it is broken. The natural result of this attitude is to put fractures of the skull into a position of primary importance, and to treat injuries of the brain as mere complications of them. This conception is, of course, nowadays quite exploded, and I refer to it merely that by calling attention to the relative pathological insignificance of fractures of the skull, I may give emphasis to the importance of head injury without fracture.

In relation to forces of adequate magnitude and kind, the skull behaves as a yielding and highly elastic structure, capable of undergoing considerable distortion and recovering its form without fracture. It is this property which permits of the occurrence of a whole range of important cerebral injuries altogether apart from fracture of the skull. It is out of the question that we should enter here upon a discussion of the many hypotheses that have been produced to explain the various intracranial effects of violence applied to the head. It would also be useless, since there can be no reasonable doubt that the essential primary mechanism in almost all cases is distortion of the skull.

The skull is apt to be distorted in two different ways. One is the result of a fall on the head when the cranium is compressed between the surface the patient lands on, and the weight of the body conveyed to the base by the spine. In this case a general deformation occurs diminishing the volume of the cranial cavity as a whole, and causing the acute compressive anæmia which is represented clinically by the instantaneously oncoming paralytic phenomena known as concussion. The second type of distortion is a local deformation due to a localised blow on the head. Here of course there is no general squeezing of the brain and no concussion. In both forms of deformation the brain is apt to be bruised, and when this occurs without fracture of the skull and without other cerebral injury we may get the pure form of traumatic headache due to simple unresolved cerebral contusion. I would again lay the strongest possible stress on the fact that these conditions can be set up by comparatively trivial-looking accidents, and that once established they are distressing and seriously disabling afflictions.

TREATMENT OF TRAUMATIC HEADACHE.

The headache of unresolved cerebral contusion is fortunately sometimes preventable, and almost always curable. Prevention is possible chiefly in relation to the widespread but slight degrees of contusion associated with general deformation of the skull and concussion. It is to be attempted by the strict application of the old clinical maxim that every case of concussion must be treated by a definite period of rest in bed, and the very slow and cautious resumption of active life. The duration of such precautionary treatment may, to some extent, be regulated by the presumptive severity of the contusion in the given case. The best measures of this are the extent of the patient's loss of memory for the period of the accident, and the intensity of the so-called phenomena of reaction that have followed the concussion. Supposing headaches to have developed in spite of proper preventive treatment, they may be dealt with by another and lengthened period of rest in bed. This failing, a moderate decompressive opening in the skull and dura is practically certain of success. It should be made at the place of election low down in the right temporal fossa under the muscle. Localised contusion, as it has to be more intense to produce similar symptoms, is less amenable to precautionary treatment by rest, and is more likely to call for primary operative treatment. This consists in making an opening in the skull and dura over the contused region, so that the latter may be released from pressure, its normal circulation re-established, and resolution occur. There are certain cases in which the occurrence of a serious amount of local cerebral contusion may be assumed to be present from the very nature of the injury. Such an injury, for example, is a glancing blow by a rifle bullet. Here, though the skull seems to be intact, and even the scalp is only grazed, cerebral contusion may be assumed to be present, and operation advised, even in the absence of any early symptoms.

We have now reviewed a limited but very definite and compact section of the great subject of head injuries. This review has, I hope, illustrated to some extent an important branch of cerebral pathology—the functional relations of the skull and brain—and at the same time remained in close contact with the practical realities of medical work.

VULNERABILITY OF THE BRAIN IN THE INDIVIDUAL AND IN THE RACE.

We may now ask whether this same series of facts and inferences is capable of yielding any idea of more general scope, and capable of application outside the technicalities of medicine. There is one suggestion, at least, conveyed by these facts, which, to my mind, tempts further inquiry, and that is, that as compared with what one might perhaps have expected, the brain is shown to be a relatively vulnerable organ, and that this vulnerability is due to the failure of the protective function of the skull in face of even comparatively moderate violence of certain kinds.

That in very early life the brain has a high vulnerability is no unfamiliar idea. We owe our knowledge of the fact largely to the well-known researches of our President, published, as I may perhaps remind you, no less than 33 years ago. He showed in a long series of examinations of still-born infants that in somewhere in the neighbourhood of half the subjects there was definite intracranial injury in the nature of hæmorrhage and bruising.[1] It is a good example of the essential unity of all branches of medicine that is upheld in the very structure of our Society, that the student of cerebral pathology can still turn gratefully to this classical paper in obstetrics. The similar, though doubtless less pronounced, vulnerability that exists in the adult is revealed to us not so much by direct evidence, as through the unique obstacle to the resolution of minor traumatic lesions that is produced by the bony encapsulation of the brain. Any extended consideration of this vulnerability of the adult brain brings to light the probability that it is in some special degree a consequence of the characters of the modern European skull. It is more or less common and accepted knowledge that, for example, the African races are, on the whole, much less susceptible to the minor traumatic lesions of the brain than are Europeans. Blows on the head that would paralyse the latter are sustained with comparative indifference

[1] H. R. Spencer: On Visceral Hæmorrhages in Still-born Children, Trans. Obst. Soc., 1891.

by the former, and it is obvious that this variation in susceptibility depends on a difference in the resistiveness of the skull in the two races. We thus find that our subject, in the first instance purely medical, has led us, as we suggested it might, into matters of a more general interest, and that we are now faced by questions less medical than anthropological. It is necessary, therefore, though of course, with every precaution of diffidence, to inquire whether it is possible for medicine to contribute in any useful way towards the solution of problems specifically those of anthropology. In the study of the evolution of man and the differentiation of the various races, the anthropologist is to a great extent limited to anatomical considerations of form and structure, and to him what may broadly be called functional considerations, though admittedly to be desired, are most often not available. The student of medicine, on the other hand, is primarily interested in function, and makes use of structural observations only in so far as they explain function. The tendency of medicine is more and more to lay stress on function, and to give emphasis to the principle that, at any rate in the individual, disturbance of structure lags far behind disturbance of function, while the study of function is a far more delicate method of differentiating the states of living matter than is the study of structure. The two races I have mentioned, African and European, afford incidentally a very good illustration of the difficulties of the anthropologist as seen by the student of medicine. We have full accounts of the differences of form presented by the two races, we learn that while in detail they are not very great, they are in sum at least, considerable; but we get nothing in the way of a rational explanation of the immense functional difference that is represented by the fact that while one race is capable of producing a continuously evolving culture, the other remains in this respect completely stationary both in its native habitat and in transplantation. It does not seem that there are differences of cranial capacity or convolutional complexity marked or constant enough to be correlated with this great functional disparity; it would appear, therefore, that the problem is insoluble by anatomical methods, or that the anthropologist must tend to minimise the significance of the functional difference that, from our point of view, is so great.

We have seen that the European skull does not protect the enclosed brain from injury so efficiently as does the African skull. This must be because the latter is the stronger, and more rigid. From the anatomical point of view, this superior strength is evidently not very striking, since, as far as I know, it has attracted but little attention and led to no attempt being made to measure it. From the functional and medical point of view the superior strength of the African skull is at once obvious, and is plainly a very important racial character. The superior rigidity and massiveness that in the African are not anatomically very obvious, at once become unmistakable in the skulls of prehistoric and admittedly more primitive races, such as Neanderthal man, and Piltdown man, in which the massiveness of the cranium has impressed all observers. The relative slightness and flexibility of the European cranium is, then, a leading character of the race, and since, as we have already shown, it brings with it gross functional disadvantages in the resistance of injury, we may assume that it has some deep and real significance in compensation. That is to say, it "paid" the European, so to speak, to develop a type of cranium which put him at a serious physical disadvantage in contest with his primitive competitors and even with contemporary races of to-day; what can have been the "price" he got in return that prevented the transaction from being the bad bargain it so manifestly might have been, but was not?

EVOLUTION OF THE SKULL IN RELATION TO FUNCTION.

If we survey the evolution of the skull in a very broad and general way, it is plain enough to see that the factors that destined the anterior ganglion of the primitive animal to be the brain of the higher vertebrate, rendered it inevitable that the part of the skeleton that should ultimately furnish the capsule of the brain should be from the first involved with other functions, such, for example, as nutrition and respiration. The cranium, therefore, in addition to acting as the capsule of the brain, has had to take part in forming the nasal respiratory apparatus, the apparatus of mastication, and in providing extensive areas of attachment for the trunk muscles. It cannot but be supposed that these various functions have interacted on one another, and that the interaction has compromised the perfection of the individual function. Thus, for example, the more the cranium had to provide for the attachment of masticatory and neck muscles, the less fully and sensitively could it fulfil its function of cranial capsule, and allow the smaller individual variations of the brain to have their fullest and least restricted scope. It is interesting to notice that when the skull was involved in yet another function—providing attachment for horns—cerebral development seems to have been abruptly checked. In man, even of the most primitive types, the liberation of the cranium from accessory functions took a large step forward but long remained imperfect. In Neanderthal man the brain was not uncommonly as large as, or even a good deal larger than, it is in the average European, and yet this great brain was enclosed, and perhaps we may say imprisoned, in a hugely massive cranium that gave attachment to very extensive masticatory muscles, and was encroached upon posteriorly by neck muscles far more widely than is the skull of any other race. It cannot be supposed that in such a veritable fortress of bone the brain was as free to develop its potentiality for small individual variations as is a brain less formidably enwalled.

It seems probable that a progressive civilisation—that is to say, a cultural evolution which, though perhaps aimless, is continuous—depends less on the appearance of unusually able and original individuals in the race than on the free production of quite small variations round the mean. Contributions of originality, in order to be continuously and securely built into the fabric of a culture without disturbance, should be individually small or even infinitesimal, and it is this condition that appears to be realised when the brain is free to develop its minor variability, and to be lacking when the brain is subject to the slight restricting effect of a cranium loaded with accessory functions. There seems, therefore, a certain plausibility in the hypothesis that the secret of the modern European type—and I use that term, of course, in the sense of the anthropologist rather than in that of the historian—lies in the capsular function of the cranium having acquired in that type for the first time a definitive supremacy over the accessory functions. If it is this *supremacy* of the one function that was the original variation that constituted the European type and is an inherited character in it, then it must be capable of producing progressive effects, and we ought actually to be able to detect evidence that the accessory functions of the cranium are undergoing decay. The relative slightness and low rigidity of the European skull in comparison with the African is possibly a manifestation of this process, and is probably progressive. European skulls are without any doubt remarkably variable in density and thickness, as anyone with operative experience can testify, and such variability is, at any rate, highly suggestive.

It is generally recognised that the masticatory apparatus of modern man is undergoing atrophic changes, and at no very slow rate. This is, of course, most clearly seen in the teeth, in which the process of suppression of the molars from behind forward has gone so far that already we may almost regard two fully erupted molars on each side as more properly representing the normal than three. It is to be remembered that the molars are still physiologically the most valuable of the teeth, and those the loss of which produces the most serious effects. On this

account alone, and apart from far more serious theoretical difficulties, it seems impossible to assign any value in the explanation of their suppression to disuse. A more trustworthy line of speculation is suggested by the fact that it is the anterior teeth which seem least to show the tendency towards suppression, those teeth, that is to say, which are actuated by the masseter muscle, which is not directly connected with the cranium. On the other hand, the teeth which do show the tendency to suppression are those associated in function with the temporal muscle which arises directly from the cranial wall. The cranium is, so to say, throwing off the remnants of its masticatory function, and the temporal molar group is consequently tending to disappear.

No one could acknowledge more readily than I do the speculative nature of these suggestions; at the same time it may perhaps fairly be said that they bring into some kind of relation a body of facts that possibly has not been viewed in connexion before. However that may be, I would rather claim my justification for troubling you with them in the attempt to show that even a strictly technical subject and one of everyday practical importance to the medical man, cannot exist in isolation, but tends inevitably to throw out implications of wider and wider reach, and of more and more general significance.

Goulstonian Lectures

ON SOME

WASTING DISORDERS OF EARLY INFANCY.

Delivered before the Royal College of Physicians of London

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LECTURE III.[1]

Delivered on April 1st, 1924.

IN this final lecture I propose first to deal with sulphæmoglobinæmia. I know of no instances in the literature of the occurrence of sulphæmoglobinæmia in infancy. I would therefore like to give some details of an infant who, whilst under treatment for atrophy, developed sulphæmoglobinæmia.

A child, 3 weeks old on admission to hospital, weighed 8 lb. 2 oz., and had a history of projectile vomiting. There was no evidence of pyloric stenosis; the child was of normal colour and with no physical sign of disease, but soon after admission diarrhœa developed, accompanied by a slight degree of fever, and there was a continuous fall in weight to 5½ lb. The stools during the first part of this period were very green, and then it was noted that they took on a bluish appearance, were, indeed, almost Cambridge blue. The stools were examined for the presence of *Bacillus pyocyaneus* with negative results. A few days later the sister of the ward was struck by the bad colour of the baby; he was very blue and she therefore administered oxygen, but reported that this administration made no difference to the colour. On questioning the sister, she told me that the child had been blue for short periods during the previous two or three days. For the following three weeks the child was constantly blue, the colour gradually fading during the third week. The blueness was apparently more marked at night, but this, I think, was probably due to artificial lighting. The colour was very striking, being almost of a leaden hue; it affected the skin generally, but was most marked in the extremities and mucous membranes. Blood removed for the purpose of spectroscopic examination was chocolate in colour. The spectrum showed a band in the red to the left of the D line, which remained after shaking the blood with ammonium sulphide, thus differentiating it from the band of methæmoglobin. It has been stated that the condition is probably related to the presence of a nitrite-producing bacillus in the saliva, and that nitrites are present in the urine and saliva.[1] I therefore examined both the secretions (by Gries and Gries Ilosvay tests) for nitrites, but in neither secretion was I able to find any trace of them. The urine was examined directly after it had been passed, but these investigations were not carried out when the colour was most intense. Dr. H. G. M. Henry, bacteriologist to the City of Birmingham, very kindly examined both the swab from the buccal cavity and the stools for the presence of nitroso-bacilli, and again with negative results. It is interesting to observe that from the time that the notes state "colour is apparently almost normal," the increase in weight of the child was almost continuous from 5 lb. 8 oz. to 10 lb. 3 oz., when he was discharged from hospital. During this time there was never any return of the blue coloration, and since the child's discharge from hospital, now a year ago, his condition and progress have been normal. During the early period of the child's gain in weight, and after receiving a proprietary food for seven days, œdema of face, hands, and feet developed. The œdema lasted four days, gradually disappearing. The diet was unaltered. The œdema was of the type described by Bloch as dystrophia amylogenetica, although this child had not received large quantities of carbohydrates, the amount of sugar in the food in the dilution used being about 8 per cent. I should also like to add that although the case was under my charge, the diagnosis was suggested to me by my colleague Dr. Laurence Ball.

PYLOROSPASM.

The occurrence of a definite clinical syndrome, pylorospasm, has been denied by many authorities, whilst by others it has been regarded as a stage in the development of pyloric stenosis. It is generally accepted that a super-added pyloric spasm is the cause of some of the symptoms of pyloric stenosis, but that spasm alone can cause stenosis is not generally accepted. Clinically, it appears to me that it is quite possible to separate pyloric spasm from stenosis, and I feel convinced that such a condition does occur, and that it frequently results in the production of simple atrophy, but never results in pyloric stenosis. The latter statement is, of course, difficult to prove. I can only say that I have never seen a case of pyloric spasm become one of pyloric stenosis.

Pylorospasm probably can occur throughout the whole period of the time during which the child is fed on a fluid diet, but the commonest age is about three months. The following history is usually given: The baby was a normal infant and thrived well at first, subsequently vomiting occurred and the child lost weight. Throughout the illness vomiting was frequent and often severe, and constipation or diarrhœa was present. On examination the degree of wasting is noticed to be less than usually occurs in a case of pyloric stenosis of the same age and duration of symptoms. After feeding the outline of the stomach can be seen, and very often feeble peristaltic waves. The usual experience is that when examining these children for peristalsis, "they flatter only to deceive"; what seems to be the beginning of a well-marked peristaltic wave appears under the left costal margin and rectus muscle, but suddenly when the wave seems to be going to move across the abdomen the child wriggles, contracts one side or segment of the abdomen, and when he becomes quiet again there is not any wave to be seen. At other times quite well-marked peristaltic waves occur—so marked that I have had two cases operated upon as cases of pyloric stenosis.

A pyloric tumour cannot be felt. I am aware that a contrary view is held, particularly by American writers, who state that in severe cases a pyloric tumour is palpable; that in certain cases it can be felt to contract and relax from time to time, and that this alteration in consistence serves to separate the case from pyloric stenosis in which such variation is never observed. In my opinion, if a tumour can be felt, the condition is one of stenosis and not spasm. Alteration in consistence of the tumour as determined by palpation does occur in stenosis. Indeed, at times the tumour appears to fade away, because in diastole

[1] In the second Goulstonian Lecture the word *decinormal* (THE LANCET, April 19th, p. 798, col. 1, line 47) should read *2·5 normal*.

the stomach falls over and masks it, whereas in systole the tumour is uncovered. This was first pointed out by Miller and Wilcox.[2] One other point is, I think, strong evidence against the palpation of a tumour in pyloric spasm—namely, that the surgeon, when operating and directly palpating the pylorus, has no hesitation in saying whether a case is pyloric stenosis or not. If a tumour were present in spasm he would not be able to form such a clearly cut opinion.

Pain of a colicky nature is not an uncommon symptom in contra-distinction to stenosis, in which it is rarely observed. The children are often unduly miserable and fretful. The tongue is clean and anorexia is frequently observed. In stenosis, except perhaps in the terminal stages of the condition, anorexia does not, in my experience, occur.

Constipation does not reach the severe grade of pyloric stenosis, and not infrequently it is replaced by diarrhœa, or the stools may be normal in number. Vomiting may be severe and explosive in type, approaching the projectile variety, but again the severe projectile vomit seen in stenosis does not occur; neither is there residual vomiting. The vomit does not contain mucin. Very often after the patient is admitted to hospital vomiting is not marked; this is probably due to the fact that the patient responds quickly to treatment. A recognition of the significance of this fact would have prevented my mistake in having two cases operated upon as stenosis, to which I have already referred, and in which the diagnosis was made on the marked peristalsis. In these cases vomiting had not occurred during their stay in hospital, although there was a history of its occurrence prior to admission.

X Ray Diagnosis of Pylorospasm.

Radiographic examination may be helpful in arriving at a correct diagnosis of pylorospasm, but it may lead one astray unless observations are made for at least three hours after feeding. The stomach does not show dilatation as in stenosis, and peristalsis is usually much less marked. Dr. C. G. Teall, the radiographer to the Children's Hospital, Birmingham, informs me that he thinks it is possible to differentiate between stenosis and spasm. In stenosis, although there is delayed emptying of the stomach, yet if food does pass through the pylorus it does so more or less regularly over the period observed. On the other hand, the X ray appearance of the stomach in spasm may suggest a stenosis in plates taken one hour and two hours after food, but in a plate taken three hours afterwards practically all the meal will be seen to have passed through the pylorus. Of course, if food is retained in the stomach for long periods, four hours or more, the condition is certainly stenosis.

That a wrong deduction can be drawn from radiography unless observations are made for at least three hours after feeding is shown by one of our first radiographic examinations of pylorospasm. This case clinically was a case of spasm and not stenosis, but the X ray finding was one of pyloric stenosis, because practically all the food was retained in the stomach at the end of two hours. This child came to autopsy, and the clinical view that stenosis was not present was substantiated. If this case had been examined three hours after feeding, in all probability the X ray finding would have been a different one.

Under treatment the majority of the cases do well; the vomiting stops, due to a relaxation of the spasm, and the child begins to gain weight. Some cases develop into severe atrophy and die from that condition. In these cases I think death is due to atrophy and not to spasm, and that even in severe cases the spasm can be overcome, but the atrophy cannot be cured. I do not believe that operation is ever indicated, although it is recommended for the severest cases by some writers (Talbot and Morse).[3]

From what has been said it will be apparent that it is difficult to separate cases of spasm from pyloric stenosis; indeed, the statistics of recovery in pyloric stenosis under medical treatment have been subjected to the criticism that many of the cases regarded as mild stenosis were in reality pylorospasm. As in all forms of simple atrophy, pylorospasm rarely occurs in breast-fed babies: the spasm may be a reflex one due to the presence in the stomach of large curds from cows' milk feeding. Miller and Wilcox[2] thought the condition was due to hyperacidity, because they always found a hyperchlorhydria in examining stomach contents withdrawn one hour after a test-meal. Increased hydrochloric acid is, however, not always found, and when present is quite possibly the result and not the cause of the spasm, although in some cases the beneficial effect of adding sodium bicarbonate to the milk cannot be doubted. The observation of Spencer, Meyer, Rehfuss, and Hawk,[4] that a 1 per cent. solution of sodium bicarbonate hastens the emptying of the normal stomach, shows that this beneficial effect may not be due to a simple neutralisation of excess of acid.

It has been stated that pylorospasm is a manifestation of the hypertonus of the hypertonic infant, but it is frequently seen without any other evidence of hypertonia. In a recent paper White[5] states that this condition would be more correctly called gastro-enterospasm, because when there is pylorospasm there is also, he asserts, enterospasm. He further states that "gastro-enterospasm is a manifestation of autonomic imbalance" or vagotonia. The nervous mechanism controlling gastric and intestinal peristalsis is normally kept in a state of balance by the bulbar autonomic division of the parasympathetic, and its opponent the sympathetic. This mechanism is probably only a controlling one, for it has been shown by several observers that gastric peristalsis and the pyloric reflex have remained normal after both splanchnics and also both vagi below the diaphragm have been cut (Cannon). Stimulation of the vagus produces inhibition of cardiac sphincter and contraction of the pyloric sphincter. The chief evidence on which White bases his theory is the beneficial results he has achieved by the use of atropine, "which is a specific for vagogenic gastro-enterospasm." Based on Langley's work, he suggests that an excessive production of cholin with its accompanying stimulation of vagus may be the cause of the autonomic imbalance.

Treatment of Pylorospasm.

In the treatment of pylorospasm breast milk should be given if possible, but, unfortunately, it is rarely available. In the absence of breast milk I have obtained the best results by lavage of the stomach with bicarbonate of soda (1 per cent.) daily, and the giving of an ordinary milk mixture. It has been found useful at times to give citrated milk with the resulting smaller curd. I have also frequently added to the milk bicarbonate of soda (½ to 1 gr. per oz. of milk), and in those cases where hyperacidity occurs the results are good. I have tried the thick feeding of Sauer in a few cases, but without much success, although in one case it produced brilliant results after all the other methods, including the giving of atropine, had failed. On physiological principles skim milk has been tried, but, except when diarrhœa was present, with no better result than ordinary milk mixtures. Atropine, on the whole, has been disappointing, but occasionally has appeared to be of value. It has been given as belladonna or atropine before, with, or immediately after, food. Recently White's method of giving 1/1000 gr. 15 minutes before feeding, and increasing the dose if necessary, has been tried. He states that "definite flushing" is evidence of sufficient dosage, but I found in one case marked intestinal distension—so marked that it was necessary to stop the atropine—without any sign of flushing.

The consideration of pyloric spasm leads naturally to a main subdivision of my subject:—

INFANTILE PYLORIC STENOSIS.

This is a subject on which much, very much, has been written, but which has a curious fascination for the great majority of those interested in the diseases of childhood, and which still presents many controversial points for investigation and discussion. It is

to some of these points, and to the question of treatment in particular, that I wish to draw attention. The history of the discovery of this disease is now well known, and I do not intend to enter into any extensive review of the literature. I would, however, like to point out that although the credit for having reported the earliest instance of the condition is given to one who, as Hutchison humorously puts it, bore the prophetic name of Hezekiah Beadsley, yet probably the first description in the literature was actually given by an English physician, George Armstrong, in his "Account of the Diseases most Incident to Children," published in the year 1777. His description is worth putting on record again.

"In a child about 3 weeks old that died of the watery gripes, and which I opened some time since, I found most of the stomach towards the upper orifice and almost the whole fundus in the same tender state with that of the child just now mentioned" (this is a reference to what were obviously post-mortem changes in the stomach). "But towards the pylorus the structure was firm enough, as likewise that of the intestines both small and great. The stomach was quite distended with curdled milk and victuals with which the nurse had crammed the child, mixed likewise with some of the chalk julep, but the whole intestines were remarkably empty. There was no morbid appearances to be observed anywhere but in the stomach, and this *viscus* being so full, while the intestines were almost empty, it looked as if the disease had been chiefly owing to a spasm in the *pylorus*, which prevented the contents of the stomach from passing into the *duodenum*. Perhaps cases of this kind are more frequent than is commonly imagined."

The wide recognition of the disease, not only in the British Isles but all over the world, is largely due to the work of John Thomson and Still. The distinction of first demonstrating a case in London is due to Cautley, and also to him is due the credit for persistently advocating surgical intervention when such treatment was very unpopular. Of surgeons who have contributed considerably to our knowledge and successful treatment of this disease I would mention Stiles, Burghard, Nicol, Dent, and more recently Rammstedt, of Münster, Downes, of New York, Tyrrell Gray, Seymour Barling, and Higgins.

Ætiology of Infantile Pyloric Stenosis.

The view of the ætiology of the condition that commends itself to me is the one which regards the hypertrophy as a congenital abnormality, and the onset of symptoms as due to either a superadded spasm, completing the incomplete block, or to swelling of the mucous membrane of the pyloric canal producing the same result; or to a combination of both these factors. I have already stated that in my opinion pyloric spasm does not lead to pyloric stenosis.

I would quote two cases seen recently which may have some bearing on the ætiology. At the autopsy on a case of pyloric stenosis, in addition to the hypertrophied sphincter, there were seen in the descending colon three contracted segments of bowel, quite short in length and separated from each other by bowel having a normal lumen. On microscoping the bowel it was found that in these contracted portions the circular muscle coat was much thicker than in the uncontracted portions. This hypertrophy was a real and not an apparent one, due to the contraction of the circular muscle coat. The other case was one under the care of my colleague Dr. Ball. This infant was admitted to hospital as a possible case of pyloric stenosis. The history given by the mother was to the effect that the child was normal for the first month, after which time he began to have frequent vomiting, "pumping his food up just when it went down." His bowels had always been constipated and he had wasted considerably. After admission to hospital it was noticed that vomiting occurred directly after food was swallowed, actually at the time the baby was taking the bottle; there was absence of visible peristalsis and a pyloric tumour could not be palpated. An X ray examination showed a picture that was regarded as typical of achalasia of the cardia. At the autopsy it was found that the œsophageal wall was greatly thickened for about 1 inch above the cardiac orifice, and that this thickening was due to an enormous hypertrophy of the circular muscle coat. The mucous membrane of the œsophagus was normal, and above the obstruction the œsophagus was dilated. The pyloric sphincter was normal. These cases seem to show that hypertrophy, limited chiefly to the circular muscular coat, may occur in parts of the alimentary tract other than the pylorus.

Development of Pyloric Musculature.

Prof. J. C. Brash, professor of anatomy in the University of Birmingham, has very kindly undertaken some researches in the development of the pyloric musculature with a view to determining whether this would throw any light on the occurrence of the pyloric hypertrophy. Prof. Brash has placed his results and reconstruction models at my disposal, and I am greatly indebted to him for his kindness.

The following stages in the development of the stomach musculature from Keibel and Mall[6] are interesting. In a 10 mm. embryo—i.e., aged 6 weeks—the stomach wall consists of three layers of entodermal epithelium, mesenchyme, and peritoneal epithelium. In a 16 mm. embryo (aged 7 weeks) there is a condensed zone of mesenchyme which represents the future circular layer; this is best defined along the lesser curvature. In a 22·8 mm. embryo (age 7–8 weeks) the circular muscle is complete and shows a slight thickening towards the pylorus. In a 37 mm. embryo (age 9–10 weeks) a prolonged gradual thickening of this layer, followed by an abrupt thinning at the duodenum, is distinct now and in all later stages. In a 240 mm. embryo (age 27–28 weeks) an outer longitudinal layer is distinct in the pyloric part of the stomach, and it becomes thicker towards the duodenum.

The reconstruction models are those of the stomach and duodenum of a 15 mm. human embryo—i.e., less than 7 weeks old—and a 20 mm. cat embryo, and the following are Prof. Brash's findings and comments. The form of the stomach is clearly defined in both. The differentiation of the muscular coat (primary "circular" layer only) is clear in both, especially so in the cat, which is in a considerably more advanced stage of development. There are thickenings of the muscular coat at all bends, notably in the human embryo at the well-marked incisura angularis, and in the cat embryo at the pylorus. In the human embryo the edge of the "pyloric ring" is situated at the distal part of the bend to the duodenum, whereas in the cat embryo it is at the proximal part of the same bend. It is an interesting question whether the bend to the duodenum has anything to do with the thickening of the circular coat of the pyloric canal of the stomach as far as this part, or whether the bend is the result of the sudden transition from thick stomach to thin duodenum. The latter is the more probable.

In the cat the thickening at the pylorus is so marked that the mucous coat is crumpled and nearly fills the lumen, allowing only a pin to pass through in the model at 50 magnifications. The transition to the thin coat of the duodenum is very abrupt. Differentiation is not nearly so advanced in this region in the human embryo. The apparent thickening of the mucosa at the pylorus is, however, not to be taken as absolute evidence of a growth process. It may be due to muscular contraction produced by the preservation of the embryo. There are longitudinal folds of the mucosa in the body of the stomach in this specimen, and it is stated (Toldt) that these have been seen to be produced by muscular contractions in the freshly opened stomachs of embryonic cats.

It appears that the differentiation of the circular muscle coat and the formation of the pylorus take place so early that it is impossible to come to any conclusion as to whether the actual process of the formation has anything to do with hypertrophic stenosis of the pylorus. Assuming that the appearance of the mucosa at the pylorus in the cat is due to the growth of muscle, it seems probable that the pyloric muscle develops as far as it can at an early stage and practically obliterates the lumen—i.e., the conditions in the embryo are identical with those found in

cases of pyloric stenosis at operation, or found post mortem in fatal unoperated cases. If normal conditions are produced at a later stage of development by differential growth of the muscles and the mucosa, then the cause of pyloric stenosis, assuming it to be a congenital abnormality, is likely to be found in the conditions that control this differential growth. Thus pyloric stenosis may be the persistence of a normal stage in the embryo.

The similarity between the condition found by Prof. Brash in the embryo of the cat and the condition of the pylorus at operation is, in my opinion, very striking and suggestive.

The theory that the pyloric stenosis may be due to hyperadrenalism in the mother[7] cannot, I think, be held in view of the published investigations of Barling and myself.[8] In this connexion it may be of interest to note that I have washed out the stomach of a case of pyloric stenosis (before operation) with adrenalin hydrochloride without any increase of symptoms; indeed, the child improved under the treatment, and I have also given the drug subcutaneously without any ill-effect.

Diagnosis.

In my remarks on pylorospasm I have stated that it is difficult to diagnose pyloric stenosis from pyloric spasm. In the diagnosis of pyloric stenosis the most important points are the history of the development of the illness, the presence of persistent and projectile vomiting, constipation, progressive wasting, visible peristalsis, and palpation of a pyloric tumour. Peristalsis, it is true, occurs in pylorospasm, but it is usually of much milder degree, and very rarely indeed is it the very obvious slow type so characteristic of stenosis. If with this type of peristalsis there are the symptoms detailed above, and if the presence of persistent and projectile vomiting, often very large in amount, can be verified, then, I think, the diagnosis of pyloric stenosis is justified, and the palpation of the tumour is unnecessary. If, however, the peristalsis is less pronounced, and it is difficult to be certain of the character of the vomit, palpation of the tumour is absolutely essential to the making of the diagnosis. The presence of a tumour is certain evidence of pyloric stenosis.

For a diagnosis of pyloric stenosis investigations other than the ordinary clinical examinations are unnecessary, but chemical examination of gastric contents and radiographic examination may both yield useful confirmatory evidence, and also give important indications as to the size of the stomach and the degree of stenosis. To the results obtained from the first of these methods I have already referred, and I would only add here that, although in my experience blood has occasionally been present, bile has never been found in the stomach contents or in the vomit. Dr. John Thomson, however, tells me he has seen bile in the vomit in three or four cases, and Still[9] says that he has also seen it on rare occasions. During the last few months there have been admitted to the Children's Hospital, Birmingham, two cases showing symptoms somewhat resembling pyloric stenosis, but which eventually proved to be cases of congenital duodenal ileus. In both cases bile was present in the vomit to a marked degree, and one of the cases was also definitely jaundiced.

Radiographic Investigation.

In the most recent contribution to the literature on the treatment of pyloric stenosis is the statement that the writers "do not as a rule give bismuth meals, because our experience has been that they may do harm to the infant who has no reserve power, and that they do not in ordinary cases tell us more than we can discover by clinical examination."[10] This statement is one with which I cannot entirely agree. Radiographic examinations have been carried out in a large number of my cases, and the condition of the patient has presented many grades from comparative healthiness to great feebleness, but I have not yet convinced myself that the examination has ever done any harm. At the same time, it is perhaps fair to say that in one case the ward sister informed me that in her opinion the condition of the child became worse owing to the long period (3 hours) it was kept without food; I should also say that although I have had moribund cases operated upon, I have not had them radiographed. As I have stated, radiography is unnecessary for a diagnosis, but even in ordinary cases it will tell us more than we can discover by clinical examination, unless under the head of clinical examination is included the removal of stomach contents, as for a fractional test-meal. Radiography gives us accurate information concerning the size of the stomach and its rate of emptying. As a matter of fact, it is not necessary to give the baby a barium meal to estimate the size of the stomach; indeed, Dr. Teall tells me that in his opinion possibly a more correct idea of the size is gained by not doing so.

It has been stated that X ray investigation will enable the physician to decide whether surgical or medical treatment should be carried out; my own practice is to have every case operated upon, so that I have not found radiography of any help from that standpoint, but from the point of view of investigation of the disease I think it is a very great help. For instance, radiography has shown that one of the advantages of the Rammstedt operation is that, for a time, a large part of the sphincter action is abolished, and that after a period of many weeks the normal sphincter control returns. One of the best examples of this effect on the sphincter is a case quoted in a previous paper.[8] A child, aged 11 weeks, before the operation showed on X ray examination very deep peristaltic waves, with retention of all the meal in the stomach for one hour, and of two-thirds of the meal for two hours. Three weeks later, after Rammstedt's operation had been performed, half the meal had left the stomach 15 minutes after feeding, and an hour later the stomach was almost empty. The same child, examined some five months later, and then aged 9 months, showed that emptying of the stomach contents had commenced 15 minutes after feeding, that one hour after feeding half, and two hours after feeding the whole of the meal had left the stomach.

When a barium meal is given it is usual to allow a three-hour interval between the preceding meal and the barium meal, and to allow another three hours interval before the succeeding. The meal used by Dr. Teall contains only a small amount (one drachm) of barium sulphate in an ounce of milk and an ounce of water; the child is spoon-fed, since this has been found to diminish the liability to sickness. Plates are usually taken immediately, one, two, and three hours after the meal, and another plate is taken on the succeeding day, the time after the meal being about 18–22 hours. The infant is photographed lying face downwards with the tube over the patient; this is done because of the difficulty of photographing the child in the upright position. The size of the stomach varies, of course, with the presence or absence of active peristalsis at the time of the taking of the photograph, but it is always seen to be enlarged. The largest stomach which I have seen occupied more than one-half of the abdominal cavity; this child was a girl, aged 3 months, from whom I removed, on washing out her stomach, more than 8 oz. of fluid containing a considerable amount of curd; the child made a complete recovery after operation.

The rate of emptying varies; in some cases the stomach commences to empty at once, and emptying goes on regularly all through the three hours. The amount passed through the pylorus may be considerable in this time, in one case as much as half the meal had passed, but this case was one undergoing medical treatment, and which was suffering from what proved to be a terminal diarrhœa. The cases in which a fair amount of food passes the pylorus might recover on medical treatment, and some physicians use this method of differentiating between cases which shall be treated medically and those which shall be treated surgically. I am convinced

that it is a mistaken policy to treat these cases medically, because if so treated the majority eventually become worse and surgical treatment has then to be undertaken at a greater disadvantage than if the operation had been undertaken earlier. In other cases only relatively infinitesimal amounts of the meal pass the pylorus at the end of three or even four hours, and a considerable amount is found to be retained in the stomach wash-out at the end of 18–24 hours. Indeed, in one case a stomach wash-out showed the presence of barium 48 hours after the meal had been given.

Between these two extreme types occur the great majority of cases, which show the passage of only a small part of the meal through the pylorus at the end of three hours. I might perhaps add that X ray investigations agree with test-meal investigations in that the time required for the emptying of the stomach in atrophic infants varies very considerably. The stomach may be completely emptied at the end of one hour, or in cases of spasm, as previously indicated, practically none of the meal may have left the stomach at the end of two hours, although at the end of three hours the stomach may be quite empty.

The Rammstedt Operation.

When cases of pyloric stenosis were first recognised the type of peristalsis seen and post-mortem appearances of the tumour convinced many observers that surgery offered the only possible chance of cure. The results were not satisfactory and recoveries were reported by medical means, with the result that the pendulum of medical opinion swung to the opposite extreme. I was trained, and I am very proud to acknowledge it, in one of the strongholds of medical treatment—namely, Great Ormond-street Hospital. These methods of treatment I firmly believed in and carried them out in my own cases, but the results were very unsatisfactory, my recovery-rate being a very poor one. After the war period I determined to advise operative treatment, and since the appearance of a paper on the Rammstedt operation by Gray and Pirie,[7] every case of undoubted pyloric stenosis for which I have been responsible for treatment, without any selection whatever from more or less healthy children to moribund ones, has been operated upon. Every case has been operated upon because operation has given the child the best possible chance of recovery, and because this method is the only way to determine whether operative treatment is better than purely medical treatment. A certain number of cases during that time have refused operation, and these without exception terminated fatally. In a personal communication Holt tells me that he has come to hold the same view—namely, that Rammstedt's operation should be performed in every case—a view also shared by Poynton and stated by him in a recent paper.

The Rammstedt operation, consisting essentially as it does in dividing longitudinally the pyloric musculature and allowing the imprisoned intact mucous membrane to herniate through the opening, has been made the routine operation. The advantages of this operation are that it is easily and rapidly carried out, that it allows the food to pass by the natural channel over the duodenal mucous membrane, and that it does not interfere with the normal physiology as does a short-circuiting operation such as gastro-jejunostomy. The results of Rammstedt's operation reported in this country have been very encouraging, although no one has yet been able to produce figures that will compare with those of Burghard for forcible dilatation of the pylorus. The limitations of the latter operation are, however, well expressed by Still,[9] who says:—

> "In the past eight years Mr. Burghard has performed this operation on 46 of my private cases with only one death . . . . . This no doubt depends very largely on the particular operator, and cannot be taken as proving that the operation itself is as good as, or better than, the Rammstedt method. Indeed, in the hands of some surgeons it has had very little success."

Some surgeons might perhaps be rendered most surgeons. Of hospital cases, recorded by Still, that were operated upon by forcible dilatation, there were 12 recoveries and 16 deaths, figures which are easily surpassed by the Rammstedt operation.

At operation the pylorus is found to vary in length, thickness, colour, and consistency in different cases. The length of the tumour varies from about 3/8ths to 1½ inches. The reasons why these variations occur are not obvious. It is probable, as suggested by John Thomson, that whatever the condition of the pyloric sphincter at birth, its growth after birth is more rapid than normal, and that, as I have already indicated, imprisonment of the mucous membrane with the production of the typical symptoms occurs sooner or later. According to this view, in the acute cases, in which symptoms are early and severe, the pylorus should be relatively thicker and harder than in those cases in which the symptoms are milder and develop later. This, in practice, is frequently found to be the case.

Variations in Pyloric Tumours.

I am unable to account for the variations in length of the tumour, but some interesting observations by Wheelon and Thomas[11] on the relationship of the rhythmic activity of the pyloric sphincter to that of the antrum appear to throw some light on the variations in colour and consistency of the pyloric tumour. These observers carried out a series of observations, including naked-eye observations, examinations by X rays, and also the obtaining of graphic records by placing balloons in the antrum and in the pyloric canal. By the naked eye it was observed that peristaltic waves arose in the region of the pars media on the greater curve, and that the wave was greatest just in front of the vestibule where it often stopped; as a rule, however, slight wave contractions barely visible to the naked eye swept over the entire vestibule, to begin again as a powerful peristaltic wave which passed along the first part of the antrum. This progressed until finally the sphincter shut. At times the wave passed progressively from its origin over the vestibule and the first part of the antrum. When contracting, the force of the contraction was enough to cause marked anæmia of the part. This anæmia began at the gastric end of the antrum and gradually increased until the entire antrum was bloodless; at this point the sphincter began to lose colour, and this loss of colour persisted during the return of blood to the gastric portion of the antrum. All the methods used by these investigators showed that the antrum and pyloric sphincter are rhythmical in action—i.e., contractions and relaxations follow each other in a regular sequence. During the period of contraction of the antrum the antrum is pale, but the sphincter is relaxed and red, although commencing to contract and become pale just before the whole antrum is in contraction. After the whole antrum is in contraction, relaxation and reddening of the antrum begins, and the sphincter is most contracted and palest at the time of most marked relaxation of the antrum. These cycles occur at the rate of 3 to 5 per minute and are maintained for hours. Rhythmical motility was best obtained when the stomach contained food, but typical results were obtained from the recently emptied stomach.

Now the pylorus as seen at operation in pyloric stenosis is usually pale, hard, and avascular, but occasionally it is redder, softer, and vascular. The stomach at operation has usually been emptied by a previous stomach wash-out or by vomiting, and is also usually in the relaxed diastolic condition. In this condition, according to the observations of Wheelon and Thomas, the pylorus should show the pallor and firm contraction which is usually found.

I have already stated the reasons which in my opinion make Rammstedt's operation the rational proceeding in these cases, but mention might here be made of the support which such a method receives from the radiographic studies of Cole on gastric motility in man. He showed that the amount of

contraction of the pylorus is proportional to the activity of gastric peristalsis—i.e., when gastric peristalsis is strong the sphincter is more tightly contracted. In pyloric stenosis there is, of course, very marked gastric peristalsis, and therefore the sphincter becomes more tightly contracted and the obstruction to passage of food greater. It would seem therefore, on theoretical grounds, that an operation like Rammstedt's operation, which eliminates for a time the sphincter action, is more likely to result in cure than treatment such as purely medical treatment, which does not eliminate the sphincter action.

After operation, visible peristalsis has been observed in a number of cases, it is less marked than before operation, and throughout the convalescence it becomes less and less obvious until finally it disappears. The wound in the pyloric wall soon becomes sealed with blood-clot and lymph. In a case examined 24 hours after operation the gap between the cut ends of the muscle was largely filled with lymph, the lymph being covered on the peritoneal side with a layer of blood-clot. This case also showed that even if only a thin strand of muscular tissue is left the mucous membrane will not herniate, and the condition is not relieved, for the operation was unsuccessful in this case, because the mucous membrane had been kept imprisoned by the merest shred of muscular tissue. After a time the lymph becomes organised and converted into young fibrous tissue. In a case examined 28 days after operation the herniation of the mucous membrane was well seen, and the gap between the cut ends of the muscle was filled with young fibrous tissue which was continuous on the one side with the peritoneal covering of the pylorus, and on the other side with the submucous fibrous tissue.

Post-operative Phenomena.

Full details of the operation and of pre-operative and post-operative treatment are unnecessary, as these have already been published. Successful results depend chiefly on careful attention to details. The margin between success and failure is a very narrow one, and without this careful attention on the part of the surgeon and physician failure will result. A most important factor in the post-operative treatment is the giving of initial small feeds, breast if possible, and their gradual increase. In my early cases I gave larger feeds, in amounts suggested in the paper by Gray and Pirie, but the great advantage of the small feed is that diarrhœa is less liable to occur, a complication that, if possible, should be prevented at all costs. It is interesting to note that although not adopting the same routine as that suggested by Barling and myself, Poynton, Higgins and Brydson have evolved a method of feeding in their cases which illustrates the same principle—i.e., initial small feeds cautiously increased. By this method of feeding the rapid increase in weight which occurs when larger feeds are given of course does not occur, but in many cases I am quite satisfied if the child for the first fortnight or so does not increase in weight, or only shows a small increase. Rapid increase in weight is the rule after 4 to 5 weeks, when the necessity for giving small feeds has passed away. I admit that this method of feeding is at variance with my recommendations when dealing with infantile atrophy, but I will explain my reasons for this inconsistency shortly.

Findlay[12] has very adversely criticised the giving of small feeds, and states that we continued unduly a starvation diet with fatal consequences; on the contrary, we feel convinced that by this diet we have cured cases which, treated otherwise, would have died. I have only seen one case in which the limitation of food might have been a factor in the fatal result; in that instance the child, who until a few hours prior to death had done extremely well, died from cerebral thrombosis (venous) on the twelfth day after operation; possibly if more fluid had been given subcutaneously or by rectum this would not have occurred.

The occurrence and explanation of certain post-operative phenomena is of great importance.

Diarrhœa.—All observers agree that this constitutes one of the greatest dangers to life during the post-operative period. Its occurrence is prevented to some extent by the giving of small meals as already stated, but even in cases so fed it may develop and prove a fatal complication. Like all atrophic children, these patients are liable to attacks of diarrhœa, but the liability appears to be greater than in simple atrophy. There is probably more than one cause of diarrhœa; one of the most important causes, it seems to me, is the diminished absorptive power of the intestine. The shrivelled, empty, atrophic appearance of the small intestine post mortem is well known, but there does not appear to be any anatomical change warranting the view that in pyloric stenosis the mucous membrane is atrophied. The diminished power of absorption is only for large amounts of material. The intestine has become accustomed to deal with a small amount of food only. If now, after operation, greatly increased amounts of food are allowed to pass into the intestine, it cannot absorb them, and diarrhœa results. In other words, a period of training of the intestine is necessary before the normal amount of food can be absorbed. As I have already pointed out, there is no evidence of deficiency of pancreatic lipase, and fat-splitting is normal. Probably the diarrhœa that occurs in cases treated medically can be explained wholly or in part in the same way, since in these cases diarrhœa is a late phenomenon, and associated with some relaxation of the pyloric block.

The evidence on which the foregoing statements are largely founded is based on clinical experience and from observations on the stools of patients taking small feeds only who were recovering after Rammstedt's operation. I have not given large feeds, nor have I examined diarrhœal stools, but from what has been said on the metabolism of fats, it will be remembered that when diarrhœa occurred fatty acids were present in excess in the stool. The presence of the fatty acid may give a greasy appearance to the stools, and this may be the explanation of why fat-splitting was supposed to be impaired in pyloric stenosis, and a pancreatic insufficiency inferred (Grey and Reynolds).[13]

Table I. shows two cases, observed for a considerable period after operation. The figures give the number of days on the metabolism bed, weight at the beginning and end of that period, average fat intake in grammes for 24 hours, the character and distribution of fat in stools, and percentage absorption. The first case shows that the power of absorption of fat increases as the period of time after operation lengthens, which may perhaps be accepted as supporting the view that the intestine is responding to its period of training. The other case does not show this so well, but all the experiments demonstrate that fat absorption under these conditions (small feeds and absence of diarrhœa) is good. In one experiment (R. 2), although the stools are semi-formed and absorption good, there is a high reading for free fatty acid which may indicate that the patient was on the verge of diarrhœa. For comparison with the results I have included figures showing the fat-splitting and the

TABLE I.—*Fat Metabolism in Pyloric Stenosis.*

Name.	No. days observed.	Wt. at beginning.	Wt. at end.	Distribution % total fats.					% absorption.
				Nature of stool.	Sap.	Free fatty acid.	Neutral.	Av. fat intake 24 hr.	
C. 1	12	7·10	7·12	S.F.	68·7	22·3	10·9	6·5	79·4
C. 2.	5	7·14	8·2	S.F.	76·3	20·5	3·3	12·5	84·0
C. 3.	5	8·2	8·5	S.F.	80·2	14·7	5·1	11·6	85·9
C. 4.	6	8·5	8·7	S.F.	90·3	11·4	1·9	13·3	87·8
C. 5.	4	8·7	8·7	S.F.	92·1	7·1	0·8	11·7	92·0
R. 1.	5	6·0	6·1	S.F.	62·6	19·6	17·8	4·4	87·5
R. 2.	5	6·1	6·0	S.F.	49·7	34·6	15·7	6·7	86·7
R. 3.	5	6·1	6·7	Const.	85·2	7·1	7·8	11·4	88·5
B.	4				95·2	3·7	1·0	23·0	

distribution of fat in a case which was being treated medically by one of my colleagues.

As a result of these findings I do not now, in the absence of diarrhœa, use skimmed milk feeds; if, however, diarrhœa occurs, a weak fat mixture is substituted, and the fat content increased when the diarrhœa abates. The other causes of diarrhœa are probably the same as in infantile atrophy. Thus, in all probability, in artificially fed children of this type, there is an invasion of the upper intestinal tract and duodenum with *Bacillus coli*, and bacterial fermentation of sugar with the production of diarrhœa. Such an invasion may not occur prior to the operation because of the high acidity of the gastric juice in pyloric stenosis. I have not tried giving hydrochloric or citric acid milk in these cases, but theoretically it is worth a trial in infants about 3 months old. I do, however, frequently use a less fermentable sugar than cane sugar or dextrose—viz., dextrimaltose. The dextrimaltose should be kept in solid form and added to the milk. At one period recently I had three cases recovering from Rammstedt's operation, all of whom were being given dextrimaltose with their feed. To ensure greater accuracy in measurement the dextrimaltose was made up in solution. The same solution was used for some three or four days, when all these children became very ill; one vomited, the stools were loose; they all rapidly lost weight, one losing 15 oz. in a week. The fat in the food was cut down and solid dextrimaltose substituted for the solution, and they all made a good recovery. Finally, infective enteritis is just as likely to occur in pyloric stenosis as in infantile atrophy. The incidence of diarrhœa in infantile atrophy is considerable, although naturally the figures given by different writers vary. In the 100 cases of which I worked out the ætiology of atrophy, diarrhœa occurred in 27 after admission to hospital, and loose stools in an even larger number still.

Atrophy.—In a few cases after relief of the obstruction the child, already wasted, remains wasted and atrophic for weeks before beginning to put on weight satisfactorily. This group is not a very large one but it is a very definite one. The following is the most striking example that I have met with. A child, aged 11 weeks, was operated upon when its weight was 7 lb. 10 oz.; three weeks after operation he had gained 14 oz. (8 lb. 8 oz.); for the following three months his weight varied between 7 and 8 lb., and it was not until four months after operation that he began continuously to put on weight. The gain in weight, once it had commenced, was a rapid one. During this period of four months he was discharged from hospital and readmitted three times, each time with an attack of diarrhœa. I have seen altogether four of these cases and three of them recovered. These atrophic cases are also mentioned in the paper by Poynton and his colleagues, and apparently in the cases they saw the duration of symptoms before operation was a very long one; in my cases, however, this is not so, since the longest duration of symptoms was 28 days.

Vomiting.—In some cases this ceases directly the operation is performed, but it is not unusual for occasional vomits to occur for the first two or three days after operation, or even for as long as 14 days after the operation. The vomits are, however, usually small ones, and are not of the explosive and projectile type so characteristic of the cases prior to operation. The vomiting is probably largely due to the gastritis so usually associated with pyloric stenosis, and if it becomes troublesome can be treated by washing out the stomach with bicarbonate of soda (1 per cent.); one wash-out is usually sufficient to cure the condition. The probability of the occurrence of vomiting in any given case is greatly diminished by two procedures. First, careful pre-operative treatment, which includes a stomach wash-out once or twice daily for two days; and secondly, the use of nitrous oxide and oxygen as the anæsthetic. The use of this method of anæsthesia has another great advantage—i.e., the quick recovery of consciousness by the patient; the ward sisters have been greatly impressed by the superiority of this anæsthetic over others in this respect.

Post-operative Pyrexia.—This is common; indeed, there may be hyperpyrexia, a temperature of 107·8° F. (Poynton and others[10]) having been recorded; the highest temperature in my cases was 106°; this case died, but recovery has been recorded (Gray and Reynolds) with that degree of temperature. The pyrexia is usually of short duration, 24–48 hours, and all cases having hyperpyrexia developed the condition within 48 hours of operation. Some cases have shown pyrexia before operation, and after operation the degree of pyrexia may increase or diminish; fever is not to be regarded as a contra-indication for operation. It has been suggested that hyperpyrexia is due almost entirely to the anæsthetic (Gray and Reynolds), and that it does not occur with gas and oxygen anæsthesia. I have not seen hyperpyrexia after gas and oxygen, but pyrexia certainly occurs, the highest figure recorded being 103·8°. Personally, although so far I have not been able to produce a proof that will completely satisfy me, I think the explanation of the fever is to be sought for in the dehydration that occurs in these cases. The dehydration is a result of the disease. It is probably made somewhat worse by the operation, and considerably worse by the giving of subcutaneous saline if the solution used is a hypertonic one; in other words, the fever is essentially a "sugar and salt fever." In a few cases I have used continuous rectal hypotonic salines for 24-48 hours after operation. Pyrexia has been less frequent when this method has been used, and there has not been in any case any marked degree of pyrexia.

Comparison of Operative with Non-Operative Treatment.

In estimating the value of operative treatment in pyloric stenosis it must be remembered that medical treatment alone is a very lengthy process, often lasting three to four months or more, and that the issue is in doubt for a considerable part of that time. This naturally entails great anxiety on the part of the mother, and if she is feeding the child, may adversely affect the supply of milk. Operative treatment, on the other hand, if successful, usually offers complete recovery at the end of four weeks. This being so, it follows that even if operative treatment offers no better prospect of success than medical treatment, it is the more advisable procedure.

It is only fair in comparing the two forms of treatment to say that many cases are put down in statistics as deaths under medical treatment when they should really be classed as fatalities from lack of any form of treatment. Such cases come into hospital in an advanced atrophic condition, sometimes almost, if not quite, moribund, and in a condition when it is hopeless to expect them to receive any benefit from medical treatment. However, if Rammstedt's operation is performed on these cases a certain number of them will recover, and in assessing the values of the figures I give it should be remembered that there has been no selection of cases in any way whatsoever. Some of the patients have been absolutely *in extremis*; for instance, one had a convulsion just before the anæsthetic and died shortly after the operation was over. Every case which was not discharged from the hospital as cured has been included in the list of fatal cases, even when death was not the result of the operation, but due to intercurrent infection.

Most writers on the subject of treatment of pyloric stenosis have stressed the different results obtained in hospital and private practice. Indeed, my previously published results have been criticised on the grounds that these two groups were not considered separately, and the statement has been made that "so different are the results in these two fields of practice by either method of treatment, that to combine them in any statistical investigation . . . must necessarily vitiate the conclusions" (Findlay[12]). To avoid that criticism in the present lecture I have separated my cases into private and hospital patients. It will be noticed that I have seen very few cases in private which have received medical treatment, and all of

these died. The number may be too small to be of any value; I have, however, had 11 private cases operated upon by Rammstedt's method with recovery in every case. It should be made clear that, although these were private cases, they were, with one exception, all treated in hospital. They became private patients simply because they were nursed in a private ward and because they paid nursing fees to the hospital, and in some cases, of course, medical fees as well. It is interesting to note that two cases which, because of lack of accommodation in the public wards, were treated in this ward proved fatal. I think therefore that the criticism quoted cannot be accepted as a valid criticism of my results.

The results I have obtained by medical treatment make very sorry reading, but bad as they are, worse have been recorded (Warren[14]), and as a basis for comparison they show what infinitely better results have been obtained when the help of a surgeon has been sought. The largest series of cases of pyloric stenosis with which I am familiar is Still's series of 248 cases[9]; his recovery-rate in private cases treated medically is a wonderful one, yet his view is that "when the mother is breast-feeding the infant, it is usually the wisest course to proceed at once to operation." He comes to this conclusion after discussing, as I have done, the effect on the mother of the anxiety engendered by lengthy medical treatment. In the following tables I have given for comparison with my own results those of Still (Table II.), and the results of Rammstedt's operation as given by Gray and Reynolds, and also by Poynton, Higgins and Brydson. (Table III.) The figures of the last group of writers are the most recently published ones, and show quite the best results so far recorded by British workers.

TABLE II.—*Comparison of Results of Cases Treated by Medical Means and by Rammstedt's Operation.*

—	Hospital cases.			Private cases.			Total.		
	Total.	Cured.	% of cures.	Total.	Cured.	% of cures.	Total.	Cured.	% of cures.
PARSONS—									
Treated medically ..	37	5	13·5	4	0	0	41	5	12·1
Rammstedt's operation ..	59	27	44	11	11	100	70	38	54·2
STILL—									
Treated medically ..	98	43	43·8	127	113	88·9	225	156	69·4
Rammstedt's operation ..	19	10	52·6	10	8	80	29	18	62

TABLE III.—*Results of Rammstedt's Operation.*

—	Cases.	Recovery.	% of cures.
Parsons	70	38	54
Gray and Reynolds	42	17	41*
Poynton, Higgins, and Brydson	57	42	73·6†

* Calculated from statistics given in paper.

† These authors give 70 per cent. recovery in 55 cases. They, however, exclude two cases (one cured) which should be included to compare with my series. Their percentage of cures is, however, calculated incorrectly, it works out at even a better figure than the one they give.

The operation has been done for me by several of my surgical colleagues, but in the majority of cases by Mr. Seymour Barling; it is interesting to note that the results obtained improve with each year, the recovery-rate for 1923 in 17 cases, being 70·5 per cent. If an analysis of the 32 fatal cases be made it is found that the length of time they survived the operation can be grouped thus: Not more than 24 hours, 9 cases; 1–3 days, 5 cases; 3–7 days, 4 cases; 7–14 days, 6 cases; over 14 days, 8 cases. In 12 cases the cause of death was post-operative collapse; in seven cases diarrhœa and in five cases bronchopneumonia. In two cases the bronchopneumonia was probably a complication of whooping cough. Hæmorrhage, peritonitis, and cerebral thrombosis were responsible for one death each, and in one other case, as I have already pointed out, the operation was an incomplete one.

I feel convinced that early diagnosis and early operation are essential to give the child the best chance of recovery. The reason why my results after Rammstedt's operation are so much better in private than in hospital cases is, I believe, because the former group of cases are usually diagnosed and operated upon earlier than the latter group. The truth of the statement that the shorter the time of duration of symptoms before operation the greater are the chances of recovery has been conclusively demonstrated by Poynton, Higgins and Brydson.

Conclusion.

In these lectures I have tried to lay before you the various views held as to the causation of infantile atrophy, the reasons for and against such views, and fresh experimental data in support of what seems to me to be, in the present state of our knowledge, the best explanation of these wasting disorders of early infancy. I have attempted to prove three theses:—

1. That in many cases there is a great deal of evidence in support of the view of the earlier English writers—Charles West, Eustace Smith, even Pemell and "J. S."—that the onset of infantile atrophy is due primarily to the supply of insufficient and unsuitable food.

2. That however the initial loss of weight has been produced the continuance of the atrophic state depends upon an altered metabolism and not upon disorders of digestion and absorption.

3. That the rational treatment of pyloric stenosis of infants includes the performance of the Rammstedt operation at the earliest possible moment.

If the arguments put forward have failed to carry conviction the reason is, I believe, not because the foundations on which they are based are unsound, but because I have not builded well.

Lastly, I would like to express my most grateful thanks to my colleagues, medical, nursing, and laboratory, for the generous help they have afforded me without which these lectures could not have been given; indeed, any merit which the lectures may possess is largely due to their assistance.

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THE LATE DR. W. H. BARRETT OF SOUTHPORT.—Dr. Barrett died at Le Havre on April 22nd on board his yacht *Muriel*. Owing to the breaking of a gangway ladder about a month ago he met with grave injuries, and whilst recovering therefrom on board he was attacked by a fatal pneumonia. The remains were taken to Southport and laid to rest there on April 24th. Dr. Barrett had retired from an extensive practice in Southport about ten years ago. Ever a keen sportsman, he took great interest in motoring and was an active yachtsman and a member of the Royal Clyde Yachting Club. After graduating M.B. and C.M. at Edinburgh University in 1883, he was for a time pathologist to the Royal Edinburgh Asylum, and lecturer in Queen's College, Belfast. He then moved to Southport, where he soon acquired a large practice and was an hon. medical officer of the local infirmary. His winning personality will be greatly missed by many friends in and beyond Southport. Dr. Barrett leaves a widow, two sons, and a daughter.

THE RELATIONSHIP BETWEEN THE ISLETS OF LANGERHANS AND THE ZYMOGENOUS TISSUE OF THE PANCREAS.

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IT is generally assumed that the pancreas consists of two separate and distinct parts, the zymogenous tubules and the islets of Langerhans. It is further accepted by many that the "internal secretion" of the organ is carried out by the islets and not by the zymogenous tissue. Thus, it follows, according to the current view, that "insulin" is formed only by the islets. The fundamental question at issue concerns the claim of the islets to rank as organs or masses of tissue *sui generis*. The experimental evidence has been conflicting as to whether these bodies maintain a constant form and mass under varying physiological conditions of the pancreas, or whether, on the other hand, they may undergo changes concomitantly with changes in the pancreatic parenchyma as a whole.

History.

My own interest in the subject was aroused 20 years ago by the appearance of a very important paper by Dale,[2] who found that an increase in the amount of islet tissue may be induced by exhausting the pancreas by means of secretin. Vincent and Thompson [9 10 11] came to the conclusion that the islets are part and parcel of the general secreting tissue of the pancreas. Under certain conditions (inanition) the islet tissue is markedly increased, most probably at the expense of the zymogenous tissue. If, after a period of inanition, an animal be restored to its normal condition, the pancreas likewise returns to the normal, the amount of islet tissue becomes normal, and the presumption is that alveoli are reconstructed from islets. The islet columns are frequently in complete anatomical continuity with the surrounding zymogenous tubules, and all kinds of transition forms are common throughout vertebrates. The work of Dale was also confirmed.

Bensley in 1911[1] employed methods different from those of Vincent and Thompson, and came to very different conclusions. It is largely owing to the acceptance of Bensley's results that the majority of authors believe in the "separate organ" theory of the islets.

A communication by Lane[6] had appeared in the year 1907. In this attention was called to two different kinds of cells within the islet; specific granules were described in each kind of cell.

Since the date of Bensley's communication several papers have appeared on the subject. Among those who supported the view that the islets are independent structures may be mentioned Weichselbaum,[12 13] Homans,[3] and perhaps the majority of pathologists. On the other hand, Laguesse [4 5] and Saguchi,[8] not to mention others, have strongly supported the views put forward by Vincent and Thompson.

Structure of the Islets.

Some years ago I carried out (in conjunction with J. P. Parsons) an investigation, using the histological methods of Lane and Bensley, and saw no reasons for changing my view. Continuity between islet and zymogenous tubules is a common occurrence throughout vertebrates. But Bensley, and others who agree with him, insist that the islet cells constitute a double histological entity, and that each of the two kinds of islet cell is distinguished from the zymogenous cells by absolutely characteristic cytological features—that is to say, by the possession of specific granules reacting to particular stains. In other words, although the zymogenous tubules may appear to run into the islet tissue, there is in reality a sudden change when we pass from a zymogenous cell to an islet cell, since the latter contains none of the specific contents of the former, and possesses for its part specific granules peculiar to itself. On this view no cell may rank as an islet cell unless it contains granules of one or other variety.

It may not be known to those who have not worked at the question how far the attitude just presented depends upon the results of work by two particular histological methods—staining by neutral gentian and acid fuchsin and methyl green. In the case of these stains it is impossible to be quite sure that we have used quite the same staining fluid as that used by previous workers. The quantitative details for making up the staining fluids are not very explicitly given, and there is considerable confusion as to the precise chemical nature of the dyes themselves.

The specific nature of the A and B granules has not been proved. Using the Lane B staining method with material from the guinea-pig we found that the histological picture corresponds fairly well with what Lane, Bensley, and others have described; some of the cells ("B cells") appear violet, due to the presence of violet-stained granules, and others (the "A cells") faintly coloured with the orange G. Employing Lane's method for the A cells, it was not always easy to mark their limits, and their nuclei did not appear to differ in shape from those of the B cells. Speaking generally, the A and B cells do not come out as clearly as one would expect after reading the descriptions of the above-mentioned authors. Sometimes it is even difficult to say whether a particular deeply-stained cell is to be put in the A or B category; the tint is sometimes brownish mixed with violet, or vice versa. In many cases only part of the cell is stained, in other cases one part of the cell stains more deeply than another. Thus the A cells (Lane's method) may be deep violet in one part, and the colour may fade away so that the other end of the cell resembles in tint the almost unstained surrounding B cells. It is thus by no means clear that we have to deal with two different types of cell. It seems possible that there are various stages of activity revealed by differences in staining reaction. Moreover, the investigation convinced us that the acinous cells of the pancreas contain granules which give staining reactions very similar to those of the B cells of the islets, and if the acid fuchsin and methyl-green method be employed, we find scattered throughout the pancreas certain cells which stain deep red, while others are green.

It cannot be allowed that the criterion for "transition" above referred to should be insisted upon. We can conceive that a real transition between zymogenous and islet cell might present itself in a different way. The number of zymogenous granules in an acinous cell might become gradually reduced as one approaches the edge of an islet, until at a certain point the cells are found to contain no such granules. Careful examination of these might then reveal the granules which are supposed to be specific for islet cells. Thus, there might be a certain degree of suddenness in the occurrence of the "islet granules," though the total change might reasonably be regarded as a real transition from one tissue to the other. This seems the more plausible in view of the anatomical continuity which is admitted to occur.

Effect of Inanition on the Amount of Islet Tissue.

Vincent and Thompson studied the effects of inanition in the dog, cat, pigeon, and frog, and reported that in these animals the effect is markedly to increase the amount of islet tissue at the expense of the zymogenous. These results, so far as concerns the bird, have been fully confirmed by Laguesse. Since that time the effects of inanition have been studied upon the rat, gopher, guinea-pig, and hen, with results entirely confirmatory of those of Vincent and Thompson. Bensley is of opinion that the apparent increase in islet tissue is accounted for by the normal variation which occurs. If this were the case it might surely happen in many cases that the

mistake might be in the opposite direction. So far as we can learn, Bensley does not appear to have reckoned with the *amount* of islet tissue under any conditions. By his method he has counted the *number* of islets, and says that this is constant. Now surely the important point is the actual amount of islet tissue. Three or four large islets might easily represent a vast increase in islet tissue over a score of small ones. What happens, indeed, in many cases is that the very small islets, consisting of only a few cells, are increased enormously during inanition. Bensley's method is incapable of noting such a change. In the work carried out in conjunction with F. D. Thompson the ratio between the amount of islet tissue in the inanition animal and that in the normal pancreas was calculated by drawing the islets in ten successive sections with a camera lucida, and cutting out and weighing the paper enclosed in the outlines. In the pigeon the ratio was as 4·22 to 0·93. In the later investigations the planimeter was employed. By this method the amount of islet tissue in the hen after a period of inanition was found to be three times as great as in the normal.

The islet tissue found after inanition (including presumably many new patches) always stains well by the Lane B method. Thus they cannot be confused with patches of simply exhausted zymogenous tissue.

Effects of other Changes of Conditions on the Amount of Islet Tissue.

In rats a pure carbohydrate diet markedly increases the amount of islet tissue, and in frogs extirpation of the spleen produces a similar effect.

Conclusions.

From the above considerations we may with considerable reason conclude that the islets of Langerhans are not separate and distinct organs. They represent temporarily modified portions of the secretory tubules of the pancreas. It is true that by certain modes of staining some cells of the islets may be differentiated from others, but the differentiation may point to different stages of activity and not indicate two distinct types of cell. Moreover, these are signs of a similar differentiation among the cells of the zymogenous tissue. The islets are anatomically continuous with the zymogenous tubes, and the two kinds of tissue may be seen to merge one into the other. During inanition and under other circumstances the amount of islet tissue is regularly and markedly increased.

The view here presented is strongly supported by Oertel[7] from the pathological standpoint. This author has with great justice pointed out how meagre is the evidence which would convict the islets of Langerhans of being responsible for the secretion of insulin.

At the time that the discovery of insulin was reported by the Toronto investigators, I felt considerable doubt as to whether the controls were sufficiently rigid, and as to whether insulin might not be obtained from glandular organs other than the pancreas. At my suggestion E. C. Dodds and F. Dickens* have applied their method to the submaxillary gland of the ox, and have found that this organ yields 710 original Toronto rabbit units per kilo of gland. Several observers of the Toronto School have prepared insulin from various organs and tissues of the body, but the fact that such large quantities as we have just quoted can be prepared from a gland so like the pancreas in general structure cannot be without some fundamental significance.

It is yet too early to state dogmatically the relation between the fact discovered by Minkowski that extirpation of the pancreas produces diabetes, and the other fact that a pharmacologically active substance capable of reducing the blood-sugar can be obtained from the pancreas and other organs.

* Privately communicated.—S. V.

(*Continued at foot of next column.*)

THREE CASES OF NEW GROWTH OF THE APPENDIX CÆCI.

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Two distinctly different kinds of new growth in the appendix cæci have been described under the name of carcinoma. One, a columnar-celled growth, has the histological characteristics of the type of carcinoma which occurs commonly in other parts of the intestinal tract, and exhibits, by a general dissemination of the new growth, the usual features of malignant disease. The other kind of growth is spheroidal-celled, and, although showing microscopic appearances suggestive of a carcinomatous nature, does not present other usual signs of malignant disease: invasion of the tissues is localised, and there is no tendency to metastatic dissemination. In its histological characteristics, and in the localised limitation of its invasion of the tissues, the second kind of new growth of the appendix resembles closely the type which has been described by Krompecker under the name of basal-celled carcinoma.

The three following cases, all of which belong to the second group, have occurred amongst the cases in which the appendix has been removed at the South London Hospital for Women during the last three years.

CASE 1.—A single woman, aged 21, admitted under the care of Miss E. Davies-Colley, with a diagnosis of chronic appendicitis. There was a history of an acute attack some two years previously, with persisting pain and tenderness about the right iliac region.

CASE 2.—A married woman, aged 39, suffering with a fibroid tumour of the uterus with severe menorrhagia, admitted into hospital under the care of Miss M. Houndsfield. In the course of an operation for the removal of the fibroid tumour it was found that the appendix was adherent to neighbouring parts, and that its tip was enlarged and bulbous. In this case there was not any history of past illness or symptoms suggesting any disease of the appendix.

CASE 3.—A married woman, aged 31, suffering from menorrhagia, was admitted under the care of Miss Davies-Colley. There was some tenderness in right iliac region, and an exploratory operation carried out. It was found that the appendix was adherent to the neighbouring parts, and presented a sharp kink at about the middle of its length.

Remarks.

All three appendices showed definite macroscopic changes which were suggestive either of new growth or of tuberculosis. In Case 1 the new growth was presented as a general, indurated, thickening of the proximal portion of the appendix, the area of thickening was of whitish appearance, and the lesion was not circumscribed so definitely as in the two other cases. In Cases 2 and 3 there was an oval nodule of caseous appearance in the wall of the appendix. In Case 2 the nodule of new growth occupied the tip of the appendix, and the lumen of the tube above was pervious throughout. In Case 3 the new growth was

(*Continued from previous column.*)

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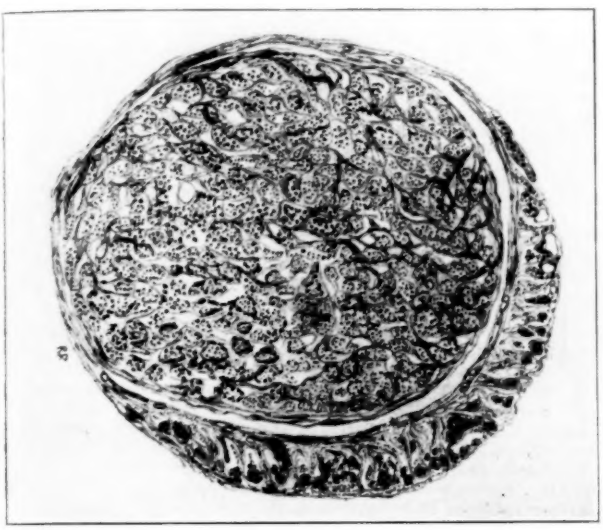
situated at about the middle of the length of the appendix, just where the kink had occurred, and appeared to occlude the lumen completely.

In all three cases the histological appearances of the new growth were essentially similar (see Figs. 1 and 2). In each case the new growth consisted of columns, or continuous tracts, of spheroidal cells, showing a differentiated peripheral zone in which the cells

FIG. 1.



Drawing of transverse section through new growth and appendix wall from Case 3. (Both figures are from drawings by Dr. Ruth Dingley.)

tended to assume a cubical form. These columns of cells were included in alveoli formed by a fibrous reticulum, or stroma, the amount of which, relatively to the mass of spheroidal-cell growth, varied considerably in the three cases. In Cases 2 and 3 the new growth was represented mainly by the spheroidal cells, and the bulk of the fibrous reticulum was relatively small; the appearances were those of an encephaloid carcinoma. In Case 2 the bulk of the fibrous reticulum was more considerable and the general appearance was that of a carcinoma of the scirrhous type. In Case 3 the new growth had apparently occluded the lumen of the appendix completely. The lining epithelium had disappeared and only traces of the submucosa—in the form of small, isolated, masses of lymphoid tissue—remained. In this case the new growth had extended, through the muscle coat, to the subperitoneal layer. In Case 1 all trace of the mucosa had disappeared. In Case 2 the new growth appeared to be confined strictly to the muscle coat, and the mucosa was intact throughout.

In none of the three cases were the appearances those of a carcinoma originating in the epithelium of the intestinal mucosa, and alternative explanations of the cause of the new growth have to be considered. Some pathologists have suggested that these new growths of the appendix originate from an embryonic "rest." Other pathologists have regarded these new growths of the appendix as being of the nature of endotheliomata and, at any rate, as originating from some inflammatory condition of the appendix. In connexion with the latter hypothesis it will be noticed that in all of these three cases there was anatomical evidence of past inflammation of the appendix. In addition, there was in one case a quite definite history of an attack of acute appendicitis some two years before the new growth was discovered; and, in a second case, the new growth was discovered in the course of an operation for the relief of what appeared to be a chronic appendicitis. It should be added that, up to the time of writing and one year after the removal of the appendix in the third case, the several patients have remained free from any indication of recurrence of any trouble connected with the new growth which was removed by operation.

FIG. 2.

Showing portion of wall of appendix from Case 3.

Note.—Since writing the above, a fourth case of new growth of the appendix has been operated on at the hospital. The patient was a married woman, aged 35 years, who was admitted under Miss Davies-Colley for uterine fibroids. At the operation the appendix was found to be tightly bound down; there was a marked constriction near the tip. A small yellowish nodule was found at the tip: the microscopic appearances of this nodule were similar to those in the other cases described.

THE PSYCHOLOGY OF VERTIGO.

BY W. F. MENZIES, M.D. EDIN., F.R.C.P. LOND.,
MEDICAL SUPERINTENDENT, STAFFORDSHIRE MENTAL HOSPITAL, CHEDDLETON.

IN the endeavour to explain some common intracranial phenomena, whose physiological bases are little open to direct observation, it is usual to formulate theories; these are certain to be wrong, but if they are in accordance with observed facts they form for the time being useful working hypotheses. Vertigo is one of the phenomena which are not easy of approach from a common angle, coming as it does into the province of the general physician, the oculist, aurist, neurologist, and psychologist. In the recent combined discussion at the Royal Society of Medicine many facts from these various viewpoints were recorded, but the very nature of such a discussion precluded the possibility of correlating them.

Sequence of Processes Concerned.

It is essential, for the purposes of analysis, to dissociate the physiological processes concerned in a vital phenomenon from its realisation in consciousness. Of course, both are biochemical, but the latter is secondary, and is of the nature of awareness arising

from emotility. Thus, the emotion of shame, the sensation of heat in the face and visible blushing are intimately associated, yet any one or any two or all three may occur in a given case. Again, vertigo, ataxia, nystagmus, headache, and a feeling of fullness in the head are nearly connected with changes of posture, yet any or all of them may occur in any combination. The hypothesis is here formulated that vertigo is a purely subjective sensation, and is the realisation in consciousness of the instinctive emotion of anxiety connected with the maintenance and adjustment of antigravity postures. Some clinical examples of the emotional nature of the condition are given below, but there are two other suggestive facts —viz., that the reaction time of vertigo is two to three seconds—i.e., that of an emotion, as opposed to the ·12 seconds of a cerebral reflex, and that hitherto no direct fibre connexion has been traced between the vestibular nuclei and the thalamus. Such terms as "objective vertigo" are misnomers, tending only to confuse definitions. Under this hypothesis the processes which result in vertigo are five in number: (1) a peripheral afferent stimulus, ocular, aural, or somatic; (2) a vestibular stimulus; (3) an adjustment response from intracranial and splanchnic plain muscle and from skeletal striped muscle; (4) an emotion; (5) its realisation in consciousness.

The reflex systems controlling antigravity postures which are centred chiefly in the various vestibular and other nuclei in the floor of the fourth ventricle, whose anatomical correlations are supplied by the median longitudinal fasciculus and vestibulospinal tract, and whose "locknut" is the cerebellum, receive their afferents from the semicircular canals, from the optic path in both its collicular and geniculate elements, and from skin, joints, and muscles. These systems have become increasingly intricate as the erect posture was gradually assumed, and now necessitate never ceasing changes in intracranial and vascular tonus in order to maintain a constant supply of oxygen to the neurons.

The Cortical Component.

For the purposes of quick adjustment of blood-supply the cranium may be regarded as a closed box, wherein fluid pressure is constant. The sympathetic fibres in the vessel walls are scanty, but their action is vital. Every change in posture is instantly compensated from the cardiac and splanchnic areas. Since the quantity of C.S.F. is minimal then, if more arterial blood be required the venous sinuses must partly empty; we assist this process when we instinctively inspire on rising up. But there is one exception to the closed box metaphor—viz., the vestibule and canal system—and it is precisely because the endolymph is not minimal and is free to transmit waves, that it so delicately registers the blood changes which it shares with all other parts of the encephalon and membranes. In this connexion it should be remembered that the vascular and sympathetic supply to this system is double, for internal vestibular branches arise from both carotids and vertebrals. Intracranial pressure may vary widely within certain physiological limits, and normal adjustments do not excite consciousness, but when maladjustment occurs, whether from excessive and confused stimulation, or from hampered and irregular plain muscle response, an emotional outflow is liable to be excited and the resultant conflict may enter consciousness. It may be asked why we should invoke the cortical component at all, why not be content with the pressure adjustments in the canals. The reason is that, on the one hand, intracranial adjustments are, like so many other sympathetic processes, massed reflexes, affecting equally vestibule, medulla, and cortex; and, on the other hand, there is sufficient evidence from the mental confusion, past-pointing, sensation of movement in the plane of stimulation, and other considerations of the accompanying mental state that this cortical component of vertigo exists and that it is primary—i.e., not received secondarily by way of the thalamus. What comes by the thalamus is the secondary emotion, later in the cycle of events. Likewise the medulla shares in the reflex, and vertigo from inhaling the morning cigarette is probably due to carboxylhæmoglobin in its vessels.

The Fear of Unconsciousness.

The maintenance of an adequate blood-supply to the brain is a primitive reaction, for the unconscious animal is helpless before its enemies and may very soon be a dead animal. So the fear of falling has from the earliest human stages been associated with the fear of unconsciousness. In this particular instance the warning from the canals and the quick alarm and vigorous response in plain and striped muscle awaken a defensive emotion, with adrenalin outflow and the rest, which is registered in the thalamus and thereafter conveyed to the cortex in strict accordance with the Lange-James theory. Normally, the physiological limits of the stimulus awake no emotion, then, of course, no vertigo follows. Although we know little of the endocrine and biochemical relations of an emotion, and practically nothing of its realisation in consciousness, beyond the association of pleasure with a free, and unpleasure with a restricted activity of the cortical oxidases, yet some such conception as that outlined here would appear to be necessary in order to explain the various clinical appearances of vertigo in both functional and organic conditions; mere intracranial tonus or atonia alone will not produce it. It is well known that section of the cervical sympathetic causes permanent ipsilateral dilatation of the arterioles in striate body, thalamus, and cortex. In a case of puncture of internal carotid from wound of neck, involving ligature of the common trunk, cervical sympathetic paralysis was present, but no vertigo. Again, it is recognised that at the onset of the epileptic fit the cerebral arteries are in spasm, yet vertigo is complained of by only a small percentage of those who describe a visual or auditory aura.

I cannot pretend to any opinions concerning intra-aural states beyond the routine neurological examination, but we are now in a position to consider some of the manifestations of vertigo in general medicine. The symptom is present in early paralytic dementia, where the cortex is still comparatively intact and anxiety or depression prevails. Later on, in the exalted or demented stages it is absent, although ataxia may be obvious. And so also in disseminated sclerosis the later stages of mental hebetude abolish it, although the patient can scarcely walk. A transient mimicry of this difference is to be observed in early alcoholic intoxication. Many cases of miners' nystagmus are unaware of the oscillations, and in these vertigo is unknown until some fellow workman, or the miner's agent, or too frequently the medical man, informs the patient of his condition. Thereafter all sorts of subjective sensations may arise, headache, diplopia, wavy pavements, nyctalopia, and so on, until ultimately hysteria or the anxiety complex or melancholia becomes established.

Vertigo is rare in the dark, and the neurasthenic who can scarcely walk down the street in the day-time will hurry on half-sideways at night, looking over his shoulder constantly to see who is following him. The absence of the usual visual stimuli does not come in here, for, of course, we do not walk at all if darkness is absolute. Giddiness is common to one standing on a height, but not when looking up into the sky from the ground level, although near objects are absent from the field in either case. Massed reflexes are wonderfully true to type, and their long phylogenic history brings them all for practical purposes into the class of conditioned reflexes. But if a new situation arises and if unaccustomed conditions are presented the whole process is apt to go wrong and, particularly, the vascular adjustments are confused or inadequate or excessive, and in any such case an emotion is excited in order that awareness to the danger of falling may be aroused in the organism. Syringing the ear and the vestibular reaction are instances of this. In sea-sickness the vestibular afferents are out of harmony with the optical. Birds are, from the nature

of flight, peculiarly susceptible to vestibular variation, and from the time they leave the nest balance without fear on a swaying bough. But a few swings round by the feet produce the hypnotic state, complete paralysis, or even coma in a fowl, because the vestibular stimuli are now entirely foreign to instinctive experience.

Evidence from Morbid Anatomy.

In the toxic psychoses, notably in delirium, the post-mortem findings in the neurones—cloudy swelling, chromatolysis, vacuolation, and the like—show us how profoundly blood states influence the cortical oxidases, in the slighter degrees of these mental troubles—e.g., melancholia—headache, confusion, and vertigo often coexist. Nor can we doubt that the blood state will affect the canals equally; and so the toxic element can never be left out of account in the vertigo of anaphylactic or gastric conditions, anæmia, or high blood pressure. The mechanical factor in the last two must produce confusion of afferent stimuli out of accord with those produced by the toxic element, and in anæmia oxyhæmoglobin is, for a given volume of blood, deficient. Arterio-sclerosis is often associated with high tension, and the irregular plain muscle response due to impaired vessel walls not only leads to uneven cortical blood-supply, but also arouses a defensive emotion directly. A similar effect is produced by subtentorial new growths, especially at the cerebello-pontine angle, which not only increase intracranial pressure by obstructing the outflow of venous blood, but also bring about local anæmia. Valvular heart disease limits arterial flow and retards venous return, hence deficient oxidation.

Among the cases largely mechanical in causation the classical example is head injury, especially with fracture. Here the growth of scar tissue and thickening of membranes may upset the whole sympathetic mechanism for regulating intracranial tension and hopelessly bind down the vessels. It is well known that postural headache and vertigo persist indefinitely beyond the early concussion period, as in a case of gunshot wound from shrapnel in the Boer war 25 years ago. The man earned full wages as a bricklayer and mounted ladders freely; he had learned to disregard the vertigo which was still constantly present, for experience had taught him that he would never actually fall.

The above conception would appear to cover most of the conditions in which vertigo may appear, but whatever the associations, it arises only as an emotional outflow of instinctive fear. In the falling dream anxiety appears as a vestibular hallucination; the blood pressure rises as we awake, but the anxiety is adequately symbolised and vertigo is absent. If the symbolisation is imperfect, as in the fighting dream, foes may appear to dance round the patient on all sides, or he may imagine himself turning about rapidly and striking in all directions. On awaking such patients constantly complain that the room is turning round, and if they jump out of bed may fall to the ground.

Clinical and Laboratory Notes.

RHINOSPORIDIUM KINEALYI.

BY W. LEONARD FORSYTH, M.B., CH.B. GLASG.,
MAJOR, I.M.S.
(*From the Department of Pathology, Madras Medical College.*)

THE following case is of interest on account of its rarity.

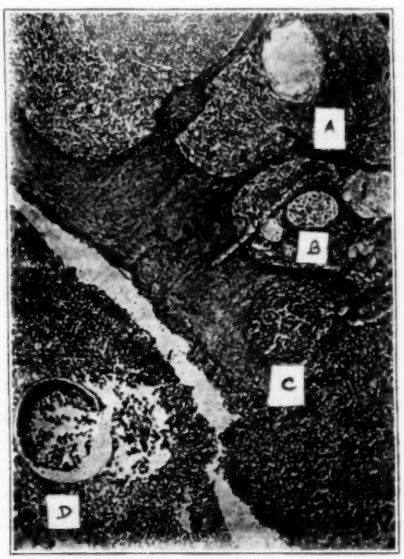
FIG. 1.

Showing suppurating growths of *Rhinosporidium kinealyi*.

M. H., aged 55, a resident of Calicut, on the West Coast of India, was admitted to the wards of the General Hospital, Madras, under the care of Major K. G. Pandalai on August 8th, 1923. Fifteen years ago patient had a small tumour in left nares which bled easily and freely—a feature of this disease. The growth persisted until three months before admission, when it spontaneously disappeared, and his nose is now free from obstruction. On the same side of the face, however, suppurating growths have appeared in the regions shown in Fig. 1. His left lacrymal sac is swollen, and probably harbours there also rhinosporidial infection. He had also a swelling under the palpebral conjunctiva of the left lower eyelid which has now healed.

Operation.—Excision of the papillomatous masses under local anæsthesia was performed by the surgeon and submitted for pathological report. The nature of the condition was not at operation suspected and the illustration shows only their site. Sections from all the areas (Fig. 2) show the parasite of rhinosporidium.

FIG. 2.



From microphotograph of a section. A, B, C, D are placed below foci of rhinosporidium.

In 1917 T. S. Tirumurti described in the *Practitioner* a series of cases, and Castellani in his Manual of Tropical Medicine mentions cutaneous surfaces, but does not quote any particular case, and so far as we are aware no case of rhinosporidium in a subcutaneous position has been previously reported in the Madras Presidency. The mode of infection by this sporidium still remains obscure, but it would appear possible that this individual auto-inoculated himself from his original nasal infection. No insect vector would appear to be necessary, and even in an original infection direct contact is suggested as a mode of spread.

THE SOURCE OF INFECTION WITH *HETEROPHYES HETEROPHYES* IN EGYPT.

BY M. KHALIL, M.D., PH.D., M.R.C.S. ENG.,
ASSISTANT DIRECTOR OF INVESTIGATION IN ANKYLOSTOMIASIS AND BILHARZIASIS IN EGYPT.

Heterophyes heterophyes (Siebold, 1852) is a trematode parasite in the intestinal tract of man, dog, and cat in Egypt. So far the life-history of this parasite and the source of infection are not known. It was, however, suspected that the second intermediate host would be found to be a fish, being a common food of the three definitive hosts. Examining the Egyptian mullet (*Mugil cephalus*), a trematode cyst was found amidst the muscle fibres of this fish in three out of eight fishes examined, the encysted cercaria being about 0·2 mm. in length. A study of the anatomy of the cercaria revealed the presence of a genital sucker lying close to the ventral sucker, a peculiarity of some members of the family *Heterophyidæ*.

A number of young kittens which harboured no heterophyes, as revealed by repeated examination of the fæces, were fed on the infested fish. After four hours cercariæ freed from their cysts were recovered from the small intestines. After 24 hours the parasites showed differentiation in the genital organs. In seven days many of the parasites, although smaller than normal, contained ova. Adult heterophyes of normal size were recovered on the fourteenth day.

These findings are interesting in being the first recorded example of a salt-water fish acting as a carrier of a parasite of man. So far search for intermediary hosts of human parasites has been confined to fresh-water fauna. The Egyptian mullet is found occasionally in the Nile, near its estuary, and the particular examples found infected were caught in the salt-water lake of Manzalah, near Port Said.

Heterophyes heterophyes infection causes dysenteric symptoms in man with occasional passage of blood and mucus. Experimental animals reveal inflammation of the mucous membrane of the small intestine.

The ovum of this parasite is one of the smallest found in human fæces, hence its presence is overlooked in a casual examination, and this may account for the small number of recorded cases of infection with heterophyes.

THE LATE DR. E. JACKSON.—By the passing of Edwin Jackson, M.R.C.S. Eng., J.P., at a ripe age at his home in Whalley Range, Manchester, on April 28th, his many patients have lost a wise and kindly counsellor, and the city one of its most diligent social workers. At the city police court, the stipendiary magistrate expressed his sincere regret and that of his colleagues, and tendered their deep sympathy with Dr. Jackson's relatives in their bereavement. A graduate of the University of London (1872) and Victoria University (1882), Dr. Jackson took the M.R.C.S. in 1876, after passing his medical studies in what was then the Royal School of Medicine in Manchester. He was for a time surgeon to the Manchester Day Nursery and Cottage Hospital, and a physician assistant at the Royal Infirmary. Dr. Jackson was deeply interested in the social, charitable, and religious work of the neighbourhood in which he practised, besides being a most industrious and efficient magistrate, and by his death the poor of his district have lost a valued and ever-ready friend.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF GYNÆCOLOGY AND OBSTETRICS.

A MEETING of this section was held on May 1st, Mr. T. G. STEVENS being in the chair.

Prof. LOUISE MCILROY read a preliminary communication, from herself and jointly with Miss D. L. LEVERKUS, entitled

Changes in the Polarity of the Fœtus during the Later Weeks of Pregnancy.

The authors said that the progress of antenatal work threw fresh light on abnormal fœtal presentations, and led to a questioning of the theories set forth in the books. The object of the present research was to ascertain the frequency of polar rotation of the fœtus in the uterus, and its influence on prognosis and treatment in obstetrical cases. There was a tendency for the fœtus to right itself to a cephalic presentation. The chief point concerned the changes from the cephalic and pelvic polar presentations, and the conclusion of the authors was that the chief factor influencing the persistence of pelvic polar presentations was extended legs; the lower limbs acted as a brace to prevent the natural curve of the spine taking place. If the spine of the fœtus was curved and the limbs were flexed, free rotation easily took place. In 22 pelvic polar deliveries it was found that extension of the legs had occurred in eight cases. The authors considered that the localisation of the fœtal heart sounds round the umbilicus was not a very reliable guide in diagnosis. Spontaneous version occurred so frequently that it was well to leave the fœtus to adjust itself in the earlier weeks, and as version usually took place between the twenty-eighth and the thirty-fourth week, no attempt at interference should be made before that time. If the pelvic presentation persisted in a primipara after the thirty-sixth week, version was advisable, as it might prevent complications at labour.

Dr. R. A. GIBBONS said that in many instances he had performed version externally after the fourth week before delivery. The important point which had been brought out was that these cases should not be interfered with until at least four weeks before full term.

Mr. EARDLEY HOLLAND agreed that extended legs caused much difficulty in the performance of artificial version, but said that the chief difficulty he had in external version was from the lower pole of the fœtus getting deeply into the pelvis. He always did external version whenever he found a breech, no matter what the pregnancy, with the reservation that if the external version was not very easy he did not persist; it was not worth while to do so until the thirty-sixth week. He had not known external version do harm; but in two cases in which external version had been performed successfully there was a small retro-placental hæmatoma.

Mr. A. W. BOURNE supported the authors' warning against too resolute attempts being made to turn the fœtus, because the placenta might thereby become separated. Also there was some danger of injury to the broad ligament. In doing external version the chief risk was of the engagement of the sharp wedge of the buttocks in cases of extended legs. At hospital the usual practice was to turn at about the thirty-sixth week. In about two-thirds of the cases in which attempts at version failed, spontaneous version occurred during the next two or three days.

Prof. MCILROY, in reply, said she had had no experience of harm or of hæmorrhage having occurred from forced version having been carried out, a practice she disapproved of. The shoulder of the fœtus might be rubbed against the edge of the

placenta and an increasing hæmatoma result. Another important point was the risk of injury to pelvic veins. The external method of version alone was used by her.

Effect of Pregnancy on Renal Glycosuria.

DR. GEORGE GRAHAM described the case of a woman the subject of glycosuria who, after being under observation 13 years, became pregnant and was delivered of a healthy child. When taken into hospital she was passing 20 to 30 g. of sugar per diem, and the sugar concentration in the urine was 4 per cent. to 5 per cent. She was very drowsy, and her breath smelt strongly of acetone. After a stay of two months she was discharged as a case of diabetes mellitus, the outlook being grave. Two years later she was again taken into hospital, as, she having lived so long, her case was considered to be one of diabetes innocens. Under careful dieting her condition greatly improved. The baby was found not to be the subject of glycosuria. Dr. Graham said pregnant women were more liable to pass some sugar in the urine because the pressure in their kidneys was lower than in ordinary people. It was the presence of dextrose in the urine which rendered a case grave and demanded serious investigation.

Pregnancy Complicating Diabetes Treated with Insulin.

Dr. GRAHAM also reported the case of a woman who had true diabetes and was treated with insulin throughout the period of gestation. The case was regarded as a grave one, because out of 66 such cases 27 were reported to have died either at the time of labour or within two weeks of delivery, while 23 per cent. died within the ensuing two years. The outlook of these patients had now been greatly improved by the use of insulin. Despite warnings and precautions, this woman became pregnant three weeks after the insulin was started. Two months later the sugar was 0·11 per cent., and later still it was increased to 0·19 per cent. At six months the question of terminating the pregnancy was discussed and negatived. The insulin dosage was increased, but the patient refused to take to her bed. The blood-sugar rose to 0·24 per cent., and the dose of insulin was increased to 15 units. The sugar then came down to 0·14 per cent., and the insulin dosage was reduced to 10 and 5 units after delivery, as the requirement of the body was then presumed to be less. The latest report was that the patient was definitely worse. Dr. Graham expressed his strong view that women with this disease should not become pregnant, as their resistance to infection was distinctly less than that of normal persons. He thought the reason women with diabetes mellitus who were pregnant died in coma was that they received a mild infection at the time of delivery. Insulin had been found to be excellent for any emergency operation.

Mr. BOURNE spoke of a patient with true diabetes who, while under observation, had two children. During the first pregnancy she was treated with great care by dieting, &c., but had no insulin. At the thirty-sixth week labour was induced. She afterwards became very septic, but survived. Though strongly advised not to become pregnant again, she did so in six months. She was treated as before, again receiving no insulin. She did not lose weight. Cæsarean section was performed now in order to sterilise her, and she was fortified by being given a dose of insulin before the operation. Her puerperium was normal, and she expressed herself as feeling better than she had for some years.

Mr. S. G. LUKER thought the outlook on these cases was unwarrantably grave.

Mr. HOLLAND referred to a case which had true diabetic coma, and in the midst of the coma gave birth to a child at full term. Under treatment with insulin she did well, making an excellent recovery. On request, he sterilised her 18 months ago; she still had diabetes.

Presacral Tumours of Congenital Origin.

Mr. ALEXANDER GALLETLY read a paper on a presacral tumour of congenital origin, with a case in which a cyst complicating pregnancy was removed by the abdomino-perineal route. The patient was a woman aged 43, who at the age of 13 had a swelling removed from the coccygeal region. At 32 years of age a similar swelling appeared in the same situation, and a second operation was carried out through the same incision. In 1920 she was delivered of a full-term living child, which was born without complications, though the perineum of the mother was badly torn. She had a second pregnancy in 1922, and then she noticed a swelling in the right buttock, which steadily increased in size. When eight months pregnant her doctor found that the fundus of the uterus had reached the infrasternal angle, and that the child's head was floating above the pelvic brim. By vaginal examination a cystic swelling could be felt. Cæsarean section was performed and a healthy living child delivered. At the operation it was seen that the retro-peritoneal cyst was firmly wedged in the pelvis. To obtain proper access to the cyst the uterus was removed, the cervix being left. The appendages on both sides were healthy. The cyst was tapped from above, and four pints of light brown fluid withdrawn. Three months later the patient was readmitted as the cyst had refilled. Mr. Victor Bonney operated under spinal and general anæsthesia, opening the abdomen by a sub-umbilical incision in the middle line. The bladder was raised, the rectum turned to the left side, the ureters isolated on each side, and the right internal iliac artery ligated in order to diminish the bleeding at the next stage of the operation. There were found to be several separate tumours each within a definite capsule. After removal of the cyst, a rubber drainage-tube was inserted and the gluteal incision closed. She now felt well and was doing her home duties.

Mr. VICTOR BONNEY detailed the operation he performed in this case, remarking that endogenous teratomata were rarely present at birth, whereas the exogenous ones were always present at birth.

Mr. A. C. PALMER mentioned two presacral extraperitoneal cysts which he had had to deal with in the last two years, not so large as in the case under discussion.

SECTION OF OTOLOGY.

A MEETING of this section was held on May 3rd, Mr. SYDNEY SCOTT, the President, being in the chair.

Mr. F. B. GILHESPY read a paper on

Aural Surgery at a Fever Hospital.

He said that during the last few years otologists had been appointed to fever hospitals in increasing numbers and in some facilities for operations were provided. His own hospital had 500 beds, but a disadvantage was the fact that it was three miles from the centre of the city. He paid two visits each week, besides emergency calls. There were entirely separate divisions for diphtheria and scarlet fever. Most of the material was supplied by cases of suppurative otitis media in scarlet fever patients, though some cases of otorrhœa came from the diphtheria blocks. Each discharging ear case had treatment thrice daily, unless otherwise ordered. Reliance was placed on a thorough drying of the external auditory meatus and a cleansing of the external ear. When, last year, cases of impetigo developed in the ward, it was noted that the ears of the affected children showed great resistance to treatment, and since then each case had a separate gown and washing bowl provided. Ears might commence to discharge in the first week of scarlet fever, or this might not occur until the sixth or even the tenth week. If it occurred during the afebrile stage there seemed to be two modes of onset; one marked by an initial rise of temperature, often with pain, the other being painless and without any rise of temperature, so that the first indication was the finding of some discharge on the pillow in the morning. In the first type the rise of temperature might precede the discharge by a day or two, and if this danger-signal was appreciated,

paracentesis could be performed in time. He emphasised the fact that the naso-pharynx was always primarily involved in scarlet fever, therefore at his hospital it was the custom to remove the adenoids if the ear discharge was not resolving. If the tonsils were found to be diseased they were removed at the same time. This could safely be done in the fourth week of an ordinary case of scarlet fever. In half of a series of 83 cases the adenoids alone were removed, and the results were equal to those in the cases from which the tonsils also were enucleated. The free bleeding following the adenoid operation relieved tubal congestion and hastened tympanic resolution in cases from which the amount of adenoid tissue removed was less than digital examination seemed to reveal. The average duration of the otorrhœa after the tonsils were removed was 15 days, a saving of a fortnight in comparison with cases treated in a special ear ward without operation. Each child received 2000 units of diphtheria antitoxin the day before the tonsil and adenoid operation, as a precaution against diphtheria, and, so far, no case had developed diphtheria after operation. Bleeding was stopped before the patient left the table, and no cases of delayed or secondary hæmorrhage had occurred. One child developed anterior poliomyelitis 16 days after the operation for tonsils and adenoids in the tenth week of the scarlet fever. Ionisation was of utility in helping to clear cavities remaining after mastoid operations, and in the conservative and radical operations which were needed. When cases entered the hospital with a history of chronic otorrhœa a few had been cured by the removal of adenoids. He had, previously to taking up this work, been impressed at a deaf and dumb institute by the number of children he saw deaf, presumably as a result of bad scarlet fever or measles in childhood. In three years at this fever hospital he had seen only one case in which the middle ear and the internal ear were attacked at the same time. That was a case of septic scarlet fever, in which facial paralysis developed within six hours of the onset of the discharge, and in a few days from the onset of the disease the child died. In these diseases the sinuses did not seem to be frequently at fault.

In conclusion, he pointed out the beneficial results from the early treatment of cases of scarlet fever otitis, for only when chronicity was established did the membrane tend to be widely destroyed. He thought arrangements ought to be made for dealing with cases of measles complicated by otorrhœa, for that disease occurred when the adenoids were at their most luxuriant growth, and timely treatment would probably prevent much wastage from ear disease in school and adult life.

Dr. KERR LOVE agreed that there had recently emerged a more enlightened view in the profession as to the need for otologists in fever hospitals. Otologists in their ordinary work seldom saw cases of scarlet fever in the acute stage, while superintendents of fever hospitals seldom saw the end-results of suppurative otitis due to scarlet fever. No case of scarlet fever or measles suppuration in the ear should be allowed to leave the hospital until the discharge had ceased, even if it meant the performance of a mastoid operation, though this was only necessary when the condition existed before the patient came in.

Mr. T. B. LAYTON referred to the importance of following up scarlet fever and measles cases which suffered from otitis, in order to ascertain how much of the permanent ear trouble was due to those diseases, especially scarlet fever; also what was the possibility that the damaged ear—which clinically might be well on leaving the fever hospital—would be the site of a fresh micro-organismal invasion. It had been difficult to follow up the cases in London, because many of the children attended schools which were not under the London County Council. With regard to the performance of paracentesis, it was important to have an otologist easily accessible to do this at the moment the drumhead was ripe for it. In his experience, however, the operation was not always successful in stopping the discharge.

Mr. J. F. O'MALLEY said it would be important to know what was the incidence-rate of middle-ear suppuration in relation to the total number of scarlet fever admissions. Dr. F. F. Caiger (who was not an otologist) some years ago said that the incidence-rate was 15 per cent., and that it was greater from 3 to 10 years of age than at other ages. That led the speaker to think that adenoids was a large factor in the production of middle-ear infection, a view Mr. Gilhespy shared.

Sir JAMES DUNDAS-GRANT remarked that there was much to be said for the view that there were many cases in which the tonsils could advantageously be left while removing the adenoids. He had seen some cases of acute suppuration of the middle ear (not scarlatinal) in which the condition hung fire until the adenoids were removed, and improvement dated from that procedure. Out of 99 cases of scarlet fever in an epidemic among the patients without enlarged tonsils and adenoids the incidence-rate was 1 in 28, and among those with enlarged tonsils and adenoids it was 1 in 12. Removal of adenoids produced only slight shock compared with that from the tonsillar operation.

Mr. H. V. FORSTER asked whether in these cases of scarlet fever, measles, and diphtheria Mr. Gilhespy applied local treatment to the nose or throat—i.e., irrespective of whether or not they had ear trouble. He believed lavage and heavy spraying in a small child was a dangerous procedure, and that ear disease was liable to result. He always spared the tonsils if possible, as their removal was a grave operation in many of these children.

Dr. ALBERT A. GRAY spoke of the work of Dr. W. T. Gardiner, of Edinburgh, who, in the presence of ear trouble, removed tonsils and adenoids at any stage of the disease, and with very good results.

The PRESIDENT pointed out that adenoids often seemed larger than they actually were because they were engorged with fluid. Usually he had removed adenoids at the time, and left the tonsils to be dealt with later. It was of no use dealing with the latter short of enucleation.

Mr. H. J. BANKS-DAVIS said that if a child had an acute mastoid and at the operation on that adenoids were found, he removed them at the same time, always leaving the tonsils alone, especially as the raw surface left by removing them would provide a site for infection.

Dr. P. WATSON-WILLIAMS asked the opener as to the use of an antiseptic spray in these cases, and advocated the spraying with collosol argentum, nearly pure, as a prophylactic measure. He agreed with the conservatism of sparing the tonsils wherever possible.

Mr. MUSGRAVE WOODMAN asked as to measures for dealing with impetigo when it was met with. A case of the kind which occurred in his experience he cleaned out and scraped, but unsuccessfully. He agreed that if a mastoid operation was required, that was sufficient for the patient to stand; but often adenoids and tonsils were diseased together, and if the neck glands were enlarged removal of tonsils constituted an important factor in their subsidence.

Mr. GILHESPY, in reply, said he never removed tonsils or adenoids earlier than in the fourth week of the scarlet fever; mastoid disease had not developed before that stage. Discharge generally ceased as soon as the adenoids had been removed. He would not operate on a scarlet fever case in which the whole naso-pharynx was intensely congested. He could not give any indications for detecting when a tonsil was diseased. Once it had been diseased he thought its structure was so altered that it was never a normal body again, therefore at some time it should be removed. He believed the incidence of otitis in fever hospitals was correctly stated as 15 per cent., but he thought the figure was somewhat misleading, as the incidence of scarlet fever was greatest in the period 5 to 10 years, while that of measles was from birth to 5 years of age. No spraying of the nose was allowed by the medical superintendent; the nose was usually wiped out with antiseptics by means of cotton-wool.

Several otological cases were shown and discussed.

Reviews and Notices of Books.

PHARMACOPŒIAS OF THIRTY-ONE OF THE LONDON HOSPITALS.

Ninth edition. By PETER SQUIRE and PETER WYATT SQUIRE. London: J. and A. Churchill. 1924. Pp. 451. 12*s.* 6*d.*

SINCE the publication of the eighth edition of this well-known book of reference, the lamented death has occurred of Peter Wyatt Squire, and the present edition has been revised by W. S. Boyack, who assisted him in his editorial and compiling work for nearly 20 years. The book came into existence 60 years ago, when the first Peter Squire, being engaged in the preparation of the British Pharmacopœia, classified for his own convenience the formulæ used in the different London hospitals, to whose prescriptions he found reference was often necessary. He saw that such a classified collection of formulæ, some of the most valuable of which were not generally known, would be useful alike to medical men, pharmacologists, and pharmaceutists, and produced the first edition of this work with a success which has been steadily maintained. The last edition was published in 1910, and in our review of that issue the amount of revision that was then necessitated was indicated, for we noted that 26 of the London hospitals had produced new editions of their pharmacopœias within the preceding two years. The same need for careful revision is proved in this edition, for since 1910, 25 of the London hospitals have again re-issued their formulæ, making considerable alterations and adding many new recipes. We have now in this series a progressive history of pharmacy as conducted in 31 London hospitals, over a period of 60 years throughout which period the book has been a recognised work of reference to the medical profession.

In many of the hospital pharmacopœias whose contents have been abstracted the formulæ have been divided into sections representing the needs of the hospital generally, and the needs of the various departments; and where the departmental formulæ are given they are now specially indicated so as to distinguish them from the general hospital formulary. The prescriptions are arranged under the headings of the various preparations so that an immediate comparison may be made between the dosage and directions as they appear in the different institutions. There can be no question of the practical utility of a book which presents an exhaustive comparison of the pharmacopœias of the London hospitals, for in these institutions the formulæ will be selected for the best reasons which the knowledge of the day can furnish, while their selectors represent leading authorities on all therapeutic questions.

SOME GERMAN NEUROLOGY.

(1) DIE EXTRAPYRAMIDALEN ERKRANKUNGEN.

By Privatdozent Dr. A. JAKOB, Director of the Anatomical Laboratory of the Psychiatric Clinic in Hamburg. With 167 illustrations. Berlin: Julius Springer. 1923. Pp. 490. $7.20.

THIS is an excellent monograph. It contains a wonderful amount of personal material, including most varieties of the syndromes commonly considered "extrapyramidal," the value of which resides in the elaborate pathological examination appended to each case. As a result, we have in this book much less than usual of the unsatisfactory speculation as to site and degree of lesion which disfigures many purely clinical records. The chapters towards the close, on the pathophysiology of involuntary movement, will repay close study.

We consider that the immense attention given in the last decade to the corpus striatum has had one rather unfortunate sequela; the zeal of some investigators has outrun their discretion, notably in regard to schematisation of striatal syndromes. Dr. Jakob follows the Vogts too uncritically—though he provides an occasional welcome exception—as regards separate "striatal" and "pallidal" symptom-complexes, and as a consequence the reader will easily discover the mutually contradictory nature of not a few of the conclusions drawn. Dr. Jakob's own explanation of the pathogenesis of involuntary movement of the types of tremor and of choreo-athetosis is ingenious but incomplete, for it fails to take into adequate consideration the occurrence of these symptoms in cases where the lesions do not involve the mechanisms that he includes in his scheme. Further, he has not given any serious consideration to the Jacksonian dictum, that negative lesions cannot give rise to positive symptoms except by way of release of function. Of the erudition of the author, and his patient and painstaking examination of a wealth of pathological data, this monograph furnishes ample evidence.

(2) DAS MENSCHLICHE GEHIRN.

Fourth to eighth edition. By Dr. R. A. PFEIFER. With 111 illustrations. Leipzig: Wilhelm Engelmann. 1923. Pp. 157. 9 gold marks.

Dr. Pfeifer's book has reached a circulation, since its first appearance in 1911, of 10,000 copies apparently. It is a curious compilation. Since the presentation of the subject is "gemeinverständlich dargestellt," we can only suppose that the intelligent laity of different countries differ in what they are able to absorb or assimilate. Frankly, the work is a medley of anatomy, physiology, clinical neurology, neuropathology, and psychology, ranging from descriptions of cerebral cytoarchitectonic structure to discussions of the mirror-writing of Michael Angelo, and touching *en passant* on microcephaly, parapraxia, the localisation of the macular system in the calcarine area, and other topics that the professional reader might be forgiven for regarding as "caviare to the general." However, there it is. There are not a few matters of general neurological interest in the volume, but how far they can be appreciated by the non-technical student is an open question. The value of many of the illustrations would be enhanced if their background were white instead of black.

(3) DIE FUNKTIONEN DES STIRNHIRNS.

Ihre Pathologie und Psychologie. By ERICH FEUCHTWANGER, Munich. Berlin: Julius Springer. 1923. Pp. 194. $2.90.

THIS monograph is based on the examination of some 200 cases of frontal lobe lesions occurring in soldiers as the result of gunshot wounds. By way of useful comparison, 200 cases of gunshot wound of the head in which the frontal lobes were, as far as could be ascertained, definitely intact, have been selected for analysis on the lines utilised in the case of the frontal group. A number of special cases are chosen for detailed description. Material of this kind obviously is of much value for elucidation of the manifold problems presented by the subject of the functional significance of the frontal lobes. On general grounds, however, gunshot wound cases are not ideal, especially when the matter of commotio cerebralis is considered; the author has done his best to meet this criticism by the above-mentioned comparison, yet it is not thereby dispelled. We should have liked rather more information on the purely neurological side—e.g., in reference to reflexes—concerning which few details are vouchsafed the reader. By far the greater part of the book is taken up, as is natural, with the disorder of higher functions revealed in frontal lobe cases. Among the general conclusions derived from his study the author indicates that perception, memory, and thinking are less impaired than the functions on the affective side;

disturbances of mood and emotion are common, as is impairment of attention, of "seriousness," and of capacity for appreciating the æsthetic, ethical, and religious aspect of things. Notable interference with the "will-to-act" characterises many cases in the author's group; there is lack of spontaneity, aboulia; the "urge" to act fails; hence the condition often results in what the patient's friends indicate as a change in "character" and "temperament." How far such defects of function are localisable is matter for discussion. It is to be regretted that there appears to have been little systematic search for apraxic phenomena. Certain conclusions in reference to the association of the frontal lobes with the function of equilibrium seem to be open to another interpretation than that given by the author.

(4) THE NERVOUS SYSTEM.

Introduction to the Histology and Histopathology of the Nervous System. By Dr. PAUL SCHRODER, Professor of Neurology and Psychiatry in Greifswald. Translated from the second revised German edition by BALDWIN LUCKE, M.D., Assistant Professor of Pathology, University of Pennsylvania; and MORTON MCCUTCHEON, M.D., Instructor in Pathology at the University. With 53 illustrations. London: J. B. Lippincott Company. 1924. Pp. 161. 15s.

As its name implies, this slender volume is no more than an introduction to a part only of neuropathology—viz., its histological side. It deals on general lines with the normal histology of the nervous system and the deviations from the normal seen in respect of nerve cells, fibres, glia, and mesodermal tissues. Controversial topics are largely avoided, the presentation being semi-dogmatic. Knowledge of these changes in nervous units is an essential preliminary to any study of neuropathology as a whole, and therefore a clear account of their nature will be found useful. Further details might have been furnished by the author in the matter of the plasma cell, the protagon granules of Reich, the multinucleation of cells (glial, Purkinje, &c.)—to mention only one or two points that suggest themselves. The book, nevertheless, conveys in small compass practical information that has often to be sought in individual monographs and scientific papers, and deserves a place on the bookshelf of the neuropathologist.

INTRANASAL SURGERY.

By FRED J. PRATT, M.D., F.A.C.S., and JOHN A. PRATT, M.D., F.A.C.S., Assistant Professors, Eye, Ear, Nose, and Throat Medical School, University of Minnesota. Philadelphia: F. A. Davis Company. 1924. Pp. 334. $5.00.

As far as surgical operations are concerned, the authors of this book have confined themselves very strictly to intranasal surgery. Except that of injection of paraffin into the bridge, no operations on the nose or its accessory cavities are described which involve any access to these regions other than through the nares. This limitation necessarily makes the account of the surgical treatment of many conditions very incomplete; it excludes, for instance, external operations on the maxillary antrum and frontal sinuses, and the surgery of the malignant neoplasms of the nose. In these circumstances it is a pity that any space has been wasted by including such a very inadequate account of malignant disease. Many conditions are mentioned, the treatment of which is only surgical to a very small extent; thus, atrophic rhinitis is accorded considerable space, but the only surgical treatment given is Beck's proposal to insert small splinters of bone under the septal mucous membrane, and no reference is made to the operations devised by Wittmaack, Lautenschläger or Hinsberg. On the other hand, many common intranasal procedures are not described in sufficient detail to be of use to the novice; the removal of polypi is not described at all, and the only reference to their treatment is that "once drainage is established and the discharge stopped, the polypi quickly disappear." Beside a method of intranasal exenteration of the ethmoid, the only operation discussed with full detail is that of resection of the septum, which occupies 50 pages, and is excellently written; the authors leave the greater part of the triangular cartilage to prevent "flapping," cutting it if necessary to make it lie straight. But we regret that they utter no warning against too indiscriminate operating on the septum. Some of their remarks are such as unintentionally to encourage the beginner in this direction; thus they state that "a deflected or thickened septum is probably the beginning of nearly all the troubles within the nose," and again, that most hay fever patients have deflected or thick septa, and that operative interference, to straighten up and thin the septum, together with establishing sinus drainage if necessary, will cure or greatly relieve many cases of hay fever. Undoubtedly, the cure of a definite or severe nasal obstruction will often relieve hay fever; but how often the resection of a slighter deflection or of a small spur fails to bring relief and how few septa are absolutely straight.

The book is profusely and well illustrated, and the anatomical plates are excellent.

RADIUM, X RAYS AND THE LIVING CELL.

Second edition. By HECTOR A. COLWELL, M.B. Lond., D.P.H. Oxon., Assistant Radiologist, King's College Hospital; and SIDNEY RUSS, D.Sc. Lond., F.Inst.P., Joel Professor of Physics, Medical School, Middlesex Hospital; Fellow of University College, London. London: G. Bell and Sons, Ltd. 1924. Pp. 365. 21s.

THE application of radium and X rays to biology is a matter of great theoretical and practical importance and of proportionate difficulty. As so often happens in the growth of a new science, the modest amount of exact knowledge which we possess has become diluted with so large a volume of imperfectly observed facts and ill-regulated experimental data that it is difficult for anyone but the expert to sift the grain from the chaff.

Dr. Colwell and Prof. Russ have come to the rescue, and in their excellent book have presented the accepted teaching with skill and fairness. This, the second edition, has been revised, and contains in a new chapter a summary of facts and theories which will be of particular interest to those working on the subject.

CLINICAL DIAGNOSIS BY LABORATORY METHODS.

Fifth edition. By JAMES CAMPBELL TODD, M.D., Professor of Clinical Pathology, School of Medicine, University of Colorado. London and Philadelphia: W. B. Saunders Company. 1923. Pp. 762. 28s.

Two qualities are demanded above all others of the compilers of manuals such as this: first, the power of clear expression, and secondly, that of discrimination. Nowadays a new volume of clinical pathology seems to blossom forth almost daily, and nowhere does the tree of knowledge produce them in more riotous profusion than in the United States. That Prof. Todd combines a singularly clear manner of expressing himself with a flair that amounts almost to genius for what to include and what to omit makes his work particularly noteworthy; it is already well known in this country, and the present edition will certainly add to its popularity. Much new material has been added, a certain amount has been judiciously eliminated, and the result is a thoroughly satisfactory manual.

The book includes within its scope all the departments of laboratory diagnosis, and that the author has been able to compass what he wished to say within the covers of a volume of such reasonable size and cost depends upon a remarkable judgment for what to omit. No methods of merely academic interest are included, but details are given of almost every technique

of approved value. The section on bacteriological methods would have been more complete had the author included a few lines on the use of porcelain filters; the opacity tube method of standardising vaccines might certainly have received mention, and where so many other media are described it was a pity to omit a simple one, such as A. Fleming's, for growing the bacillus of Pfeiffer.

Prof. Todd describes himself as Professor of Clinical Pathology. This is a chair unknown to the seats of medical learning in this country, and it would probably be well that it should continue so; none the less, the schism of "clinical" pathology from the ordinary kind has some sort of justification if it can produce men who can write such useful books as this. The illustrations deserve special mention; the coloured plates are among the best ever produced in a book of this sort and reflect great credit upon the artist, Mr. John W. Rennell, and upon the engravers and printers.

AMBROISE PARÉ.

Selections from the Works of Ambroise Paré. With short Biography and Explanatory and Bibliographical Notes. By DOROTHEA WALEY SINGER. Medical Classics Series. London: John Bale, Sons, and Danielsson, Ltd. 1924. Pp. 246. 12*s.* 6*d.*

ALLOWING that there is a necessity for yet another book about Paré, there could not be a better volume than the one before us. Mrs. Singer has given us Book XI. from Johnson's translation of 1634, together with The Apologie and Voyages into Divers Places, and the Surgical Aphorisms and Rules. She herself has contributed a learned though readable introduction, together with many informing notes upon various statements in the text. Book XI. deals with the nature of gunshot wounds and with the treatment of the same, and draws a comparison between them and the effects of lightning. Paré also combats the popular opinion that gunshot wounds are poisoned. He gives sundry illustrative cases, amongst which the most remarkable is that of Philip de Croy (p. 117 et seq.). On p. 181 we meet with the word "bavin," which Mrs. Singer explains in a footnote as a faggot, and adds that the word was still in use in the nineteenth century. It is rare, however, and the best known instance is in Browning's grim poem, The Heretic's Tragedy, "Good sappy bavins that kindle forthwith." The Aphorisms are given in the original French together with Johnson's translation, which in one instance at least is wanting, for he translates—

> "De toute beste venimeuse
> La piqueure est fort dangereuse"

as "The wounds made by all venemous (*sic*) creatures are dangerous." A study of Mrs. Singer's excerpts ought to lead many readers to explore the original works of Paré.

PEDIATRIC NURSING: ITS PRINCIPLES AND PRACTICE.

By BESSIE INGERSOLL CUTLER, R.N., Instructor in Pediatric Nursing and Supervisor of Pediatric Department, University of Minnesota, Minneapolis. New York: The Macmillan Company. 1923. Pp. 478. 14*s.*

THIS volume, which the author claims is written primarily for the student nurse, seems to cover the whole subject of children's nursing most thoroughly. No claim is made to originality, and much is acknowledged to be borrowed from the text-books of well-know American authorities, numbers of references being given. All must warmly agree with the author's conviction that the main qualifications of a good pædiatric nurse must be a love for children and the ability to get on with mothers. Knowledge of the mental and physical hygiene of children, an acute power of observation, and a faithfulness to detail are essential but secondary. The chapter on growth and development is filled with useful information and statistics. The account of the general conduct of a hospital ward gives one an insight into the elaborate care devoted in the U.S.A. to the children's ward. Certainly, there are hospitals in the British Isles which embrace more than a part of the equipment and conveniences which the author regards as essential. Probably the most useful chapter is that on the care of the premature infant, and the nutrition of infants and children, with recipes for various modifications of food for infants, is well discussed. A chapter is devoted to the special nursing procedure required for certain diseases peculiar to infants and children. A number of surgical conditions are included. The nursing of infectious diseases and orthopædic cases is not omitted.

The book is likely to be widely read and appreciated in this country.

THE CARE AND CURE OF CRIPPLE CHILDREN.

By G. R. GIRDLESTONE, F.R.C.S. Eng., and Mrs. HEY GROVES. Bristol: John Wright and Sons, Ltd. 1924. Pp. 88. 2*s.* 6*d.*

IN the first part of this little work Mr. Girdlestone presents a description of the national scheme for the welfare of crippled children which has been evolved by the Central Committee for the Care of Cripples. In the labours of this body Mr. Girdlestone has taken a distinguished share, and in conjunction with Sir Robert Jones—who contributes an eloquent foreword to the book—he has on previous occasions outlined the essentials of an effective organisation for dealing with cripples. The scheme is based on the establishment in any given area of (1) a central "hospital school" of the open-air type, specially equipped for reconstructive surgery, where the child can be retained for long periods and receive both treatment and education; (2) a chain of after-care clinics in small centres in the area served by the hospital, which makes possible the regular supervision of all children who have been discharged. It must now be well known how efficiently this scheme is already working in Shropshire, where it was first inaugurated, and in Oxfordshire, Berkshire, and Buckinghamshire, under Mr. Girdleston himself. Part II., for which Mrs. Hey Groves is responsible, forms a year-book of hospital schools and other institutions dealing with crippled children, and represents a most useful compilation by an indefatigable worker in the cause of the crippled.

This book is a most important piece of propaganda on a subject which is admittedly of great national importance. It is certain to be read with pleasure by everyone already interested in the problem. We hope that it will find its way above all to the general practitioner of medicine, whose interest and coöperation are so urgently needed if this work is to go forward.

CLINIQUE MÉDICALE DE L'HÔPITAL BEAUJON.

By CH. ACHARD, Professor of Clinical Medicine in the Faculty of Medicine of Paris. Paris: Masson et Cie. 1923. Pp. 457. Fr.25.

THE clinical method, when all is said and done, will ever make its appeal to the medical man. Nothing can take the place of a clinical demonstration, conducted with insight, knowledge, and real acumen. The disadvantage of all books containing a clinical record, however, is that the reader may fail to recapture the elusive fascination attending the actual presentation of patients and the unravelling of a case before the eyes of the onlookers. Occasionally such books become positively tedious in their efforts to reproduce an "atmosphere" by literalness of transcription. Prof. Achard's compilation, we think, achieves a happy mean. Clinical presentations are brief and utilised mainly as an introduction to informative discussions of the points raised thereby. He shows himself a master of clinical medicine, and we are especially attracted by the able neurological essays dealing, inter alia, with diphtheritic paralysis, pontine paralyses; the hemianopias, certain complications of tabes, and dissociation of the oculo-sympathetic syndrome.

Reports and Analytical Records.

"MIRA": HUNGARIAN MEDICINAL WATERS.

(MEDICINAL AND APERIENT WATER SPRINGS CO., LTD., BUDAPEST.)

THREE of these natural waters have been submitted to us for examination: "Mira" (1), a natural aperient water; "Mira" (2), a natural medicinal water; "Mira" (3) (Baby), a natural laxative water for children. When analysed we found these waters to have the following composition expressed in grammes of saline constituents per litre:—

—	Mira 1.	Mira 2.	Mira 3.
Total saline matter	55·11	23·9	14·8
Chlorine (Cl)	2·34	2·62	2·52
Sulphuric acid (SO_3)	30·05	10·91	5·80
Lime (CaO)	0·50	0·70	0·34
Magnesia (MgO)	3·90	1·72	0·60
Soda (Na_2O)	18·12	7·60	5·42
Silica (SiO_2)	0·10	0·20	0·12
Iron and alumina (Fe_2O_3 and Al_2O_3)	0·10	0·15	—
Potassium, lithium, strontium, &c. ..	Traces	Traces	Traces
Specific gravity (water = 1000) ..	1050·6	1020·88	1012·12

The above are probably combined as follows:—

—	Grains per gallon.		
	Mira 1.	Mira 2.	Mira 3.
Sulphate of sodium	2578·1	852·0	515·0
Sulphate of magnesium	817·2	361·2	124·0
Chloride of sodium	269·8	302·6	291·0
Sulphate of lime	85·7	71·4	57·0
Carbonate of lime	—	35·0	—
Silica	7·0	14·0	8·7
Iron and alumina	7·0	10·5	—

These analytical results show that the aperient water (No. 1) consists mainly of the sulphates of sodium and magnesium. It is well known that a water of this type is of general application in disorders of metabolism and elimination such as constipation, auto-intoxication arising from over-indulgence in rich foods, alcohol, &c., pyorrhœa of the gums, and a number of skin diseases, such as boils, nettle-rash, and eczema. The water is said to be mild and gentle in its action.

Mira (2), the Glauber salt medicinal water, is not so strong as No. 1 and, moreover, the ratio of magnesium sulphate to sodium sulphate is greater than in Mira (1). The action of this water is said to be milder than in Mira (1), and it is, in consequence, more adapted for chronic cases in which a prolonged course of the remedy is indicated. It is claimed that the water is suitable for the treatment of cases such as commonly resort to Carlsbad and Marienbad.

Mira (3) is a water in which the principal saline constituents are sulphate of sodium, chloride of sodium, and magnesium sulphate. The water is a useful laxative for children in cases where the ailments are connected with errors in diet. During dentition a few doses of this water relieve congestion of the gums, and in febrile conditions it may be used with advantage.

Our analyses are not in all respects in very close agreement with the figures quoted on the labels, but this is not to be wondered at as natural waters of high mineral content tend to vary somewhat in their concentrations from time to time.

(1) SACCHAROMYCIN; (2) EVATMINE.

(BRITISH ORGANOTHERAPY CO., LTD., 22, GOLDEN-SQUARE, LONDON, W. 1.)

(1) Saccharomycin is described as an active isotonic and isothermal-living yeast for which the producers guarantee that its vitality will continue indefinitely and undiminished in the ampoules in which it is supplied. Preparations of yeast, it is well known, have yielded good results in staphylococcus infections, acne, and furunculosis, while a serum obtained from animals fed on enormous quantities of brewer's yeast has been used to introduce the active principle in concentrated form. In acne fresh brewer's yeast has been successfully employed, but the smell and taste of yeast, and its tendency to cause gastro-intestinal disturbances, such as diarrhœa and flatulence, have proved drawbacks to its use. It is claimed for saccharomycin that the disadvantages of brewer's yeast are avoided, while it is activated at body temperature and so is able to retain its potency. In cases of furunculosis and acne one ampoule of the preparation may be taken daily before breakfast accompanied by syrup and water, according to precise directions supplied. The price per box of 6 ampoules is 10*s*.

(2) Evatmine is compounded of the active extract of the posterior lobe of the pituitary ⅔ gr., adrenin solution (1 : 1000) 8 minims, physiological salt solution 8 minims, and has been used for some time both in this country and especially in France for the relief of asthma, and in the treatment of persistent cough, croup, and other spasmodic affections. While adrenin and pituitary extract, both of which have been used in these affections, have not been attended with consistent results, certain French observers state that a suitable combination of the two substances produce reliable effects. The quantity of pituitary extract in evatmine while sufficiently large to secure therapeutic action is so small that adverse reaction is unlikely or impossible, while the adrenin content of an ampoule of the compound is half the usual quantity of the drug administered as a dose. The preparation is administered by slow subcutaneous injection, it sometimes being necessary to give a second injection at an interval of half an hour; in extreme cases a third injection may be made, but not more than three injections should be given over a period of 24 hours. As a prophylactic in asthma one injection is given daily or on alternate days for from two to four weeks. From one-half to one-eighth of the adult dose (1 ampoule) is given to children under 14 years of age according to the number of years. The price of a box of 6 ampoules each of 1 c.cm. is 12*s*. 6*d*.

The company's products are supplied to the medical profession, and are obtainable by the public only upon the presentation of duly signed prescriptions.

KALZANA.

(JAMES G. CLARK, 71, HIGH HOLBORN, LONDON, W.C. 1.)

This prescription, which is identical with albulactin, is made by Messrs. Wulfing and Co., of Amsterdam, and is put by the British agent on the London market in flasks of 75 tablets, each tablet containing 7½ gr. of calcium sodium lactate. The double salt is a standard preparation of calcium, and the combination is extremely soluble and easy of absorption. The therapeutic value of calcium is quite well known to all medical men, and both its chemistry and its chemical results have been demonstrated by sound authorities. Kalzana has been employed with good results in hospital and private practice, the claim being made that by its use calcium retention is effected by the addition of sodium lactate. The tablets may be taken in a little water or milk; crushing with a spoon will hasten disintegration. They may also be simply masticated, and are best taken after meals. To small children and infants they should be given well powdered and dissolved in milk.

To obtain the benefit of the drug for purposes of ordinary nutrition one or two tablets can be taken daily, but the same dose or three tablets can be taken three times a day where a special addition of lime to the diet is required, as in the case of nursing mothers. Children subject to troubles of dentition attributable to a deficient amount of lime in their food may take one or two tablets daily.

THE LANCET.

LONDON: SATURDAY, MAY 10, 1924.

INFANTILE ATROPHY.

THE problems of infantile atrophy form the subject of the Goulstonian Lectures delivered this year by Dr. LEONARD G. PARSONS, and published in recent issues of THE LANCET, his final lecture appearing in another column. Although in his introductory address the lecturer described his subject as lacking in general interest, if not indeed threadbare, it is one which has exercised the minds of the public and the profession for so long, and its importance is so great both from private and national points of view, that many readers will welcome the admirable exposition which Dr. PARSONS commences thus modestly. From the seventeenth century onwards the wasting diseases of children have produced a series of important studies by British physicians, often illuminating, but always inconclusive as regards the ultimate explanation of these phenomena. At the present time it is perhaps the work of the German school of pædiatrics, and particularly the views of CZERNY and FINKELSTEIN, which have chiefly influenced the profession. CZERNY emphasised the view that wasting is a disturbance of growth and general nutritional function rather than a disease per se, and that it occurs in certain predisposed children when subjected to certain types of feeding or to infections, the children particularly predisposed being those whom he described as suffering from the "exudative diathesis." Amongst the immediate exciting causes he particularly stressed two: one in which overfeeding with milk led to an intolerance for fat, and a second in which excess of starch caused acid diarrhœa or carbohydrate œdema. Protein he considered relatively innocuous, thus adopting a view entirely opposed to those of earlier observers such as BIEDERT and EUSTACE SMITH.

These theories, for it cannot be claimed that any exact scientific basis has yet been established for them, have certainly been useful in removing much prejudice, but they have more recently been supplanted in many minds by those of FINKELSTEIN. Like CZERNY, this observer considered fat and carbohydrate as factors of greater potential danger to the infant than protein can be, but he also proposed the theory that injury to the cells of the intestinal mucosa by the salts present in whey was of high importance, a theory which has been largely disproved by the subsequent work of WOODYATT and others. Classifying his cases according to the weight-chart of the infants, FINKELSTEIN divided them first into those where there is excessive fat, producing disturbance of balance in the carbohydrate-fat ratio, and secondly those in whom carbohydrate-tolerance was slight. From one of these initial categories the wasting child was liable, if untreated, to pass into the more serious ones of (*a*) decomposition (marasmus), or (*b*) intoxication. From these suggestive theories the Goulstonian lecturer passes to a survey of the mass of biochemical research which has been carried out in this country and in the United States during the past few years. Reviewing the figures given by HUTCHISON, by UTHEIM, by HOLT, and in his own extensive series, concerning the digestion and absorption of fat in wasting infants as measured by analysis of the fæces, Dr. PARSONS reaches the important conclusion that digestion of fat is usually efficient, and, in the absence of diarrhœa, absorption of fat is satisfactory, the two conditions under which fat indigestion may become the cause of atrophy being (1) the development of diarrhœa, and (2) the giving of high fat-content dried milks. It will thus be seen that careful laboratory work in this country, as in the United States, has failed to support the supposed scientific basis of the theories of the German authorities. In his second lecture Dr. PARSONS deals with other nutritional factors, many of which have as yet been very imperfectly studied. His remarks on the possible mechanism of the effects of vitamin deficiency are highly suggestive. CRAMER, LUMIÈRE, GROSS, and others have shown that when young animals are fed on diets deficient in vitamin A an acceleration of the passage of food through the alimentary canal occurs, and that this diarrhœa is accompanied and perhaps explained by an atrophic process affecting the intestinal mucous membrane. It may well be that herein lies the explanation of the pseudo-diarrhœa of many atrophic infants, and it is to be remembered that it is the animal whose diet contains excess of carbohydrate as well as deficiency of vitamin A which shows the most marked symptoms in these cases. In a later passage the lecturer wisely emphasises the importance in dietetics not only of the quantity, but of the quality of the protein food. Many writers upon the subject of infant-feeding, even at the present day, are prone to neglect the possibilities of errors arising from this cause. Protein is a loose term in contrast to such headings as carbohydrate and fat, for it is the amino-acids, derived from the native proteins, which are the ultimate units from which the body must build its tissues, and individual proteins differ considerably from one another in their content of various types of amino-acid. Thus HOLT has shown that lactalbumin, which is present in human milk in far greater proportion than in cows' milk, is richer in leucin, lysin, and tryptophane than is casein, and it is readily conceivable that a diet rich in total protein may be actually deficient in one or other of these essential amino-acids. Again MORO, BAUER, and LUST have all shown that in certain infants there is an intolerance to cows' milk apparently due to the absorption of certain foreign peptones. On these grounds, and in the light of his personal experience, Dr. PARSONS finds that the protein of the diet may be by no means so unimportant as the German workers have argued.

Clearly we are still far from reaching final knowledge concerning the causes of infantile wasting, but for the present the list given by Dr. PARSONS is both of practical utility and in accord with the known scientific facts. He classes the causes as follows: (1) Insufficient food, with pyloric stenosis as an occasional causal agent: (2) unsuitable food—artificial foods with excesses or deficiencies of one or more factors being the common causes in this group; (3) diarrhœa and vomiting; (4) infections such as pyelitis and pneumonia; (5) unsuitable hygienic surroundings; and (6) pre-natal and constitutional causes. It may be said that in the vast majority of cases the cause is to be found in the early groups, and should usually be preventable. To what extent infantile pyloric stenosis is preventable remains an unanswered question. Dr. PARSONS holds the view that these cases are truly a congenital disorder, but whilst the majority of observers incline to this opinion it is at present still an unproven conjecture. Happily, this uncertainty of ætiology is counterbalanced by a most pleasing improvement in the recent results of treatment, and Dr. PARSONS'S highly successful series of

cases treated by Rammstedt's operation bears out the experience of many others; few cases could be more desperate than are many of these when first treated, and the brilliant results of the modern treatment are a further triumph for the abdominal surgeon. Post-operative treatment of these cases remains difficult, and Dr. PARSONS has experienced the same dangerous tendency to diarrhœa in these infants that other observers have recorded. This he believes to be due to the failure of a starved intestine to deal with the newly arrived food-supply rather than to any pancreatic deficiency, its frequent occurrence, together with the long continuance of atrophy even after operation in other cases, being evidence of how slow and precarious may be the recovery of the organism from a nutritional disturbance, when such a disturbance has been present for some time. There comes, indeed, a point in all such cases where the general metabolic upset is so grave that it is doubtful whether its correction and the most careful after-treatment can possibly save the patient. It is the importance of early recognition followed by sane treatment that makes the study of this group of infantile diseases so useful both to the profession and the State.

THE ÆTIOLOGY OF CERTAIN LESIONS OF THE SKIN.

THE appearance of a new edition of Dr. DARIER'S Précis[1] is an event of the highest importance in the dermatological world, for, since the first edition was published in 1908, the book has stood alone. The work of a master, it possesses an individuality and a charm that at once raises it above the level of other text-books of dermatology, and the reviewer has never forgotten the advice given to him many years ago by one of the wisest of English dermatologists—to buy the "Précis" and make it his bible. Those who are privileged to claim personal friendship with the author can readily understand wherein lies the virtue of his book. Other dermatologists have, perhaps, done more original work, but no one has a more profound knowledge of his subject or a greater breadth of view, and with these is combined a literary style of a high order. The arrangement of the subject-matter, which was adopted in the original edition, remains the same, and it could hardly be improved upon. The book is divided into two parts. In the first the various eruptions and non-eruptive abnormalities of the skin are considered according to their *morphology*, so that we have chapters on the erythemata, urticaria, eczema, erythrodermias, papular, nodular, vesicular, bullous, pustular, and ulcerative eruptions, dyschromias, atrophies, hypertrophies, and affections of the follicles, hair, nails, and sweat glands. In the second part the definite diseases of the skin are dealt with—"the morbid entities of known ætiology, classified according to the nature of their causation"—such as the dermatoses produced by external irritants and the drug eruptions, the parasitic diseases, the pyodermias, the bacillary and protozoal infections, and the dermatomycoses; in this part, too, are included the various tumours of the skin, and what LEREDDE has termed the "hæmatodermias"—i.e., the eruptions associated with the leukæmias, Hodgkin's disease, and mycosis fungoides. This arrangement is simple and logical, in marked contrast with the haphazard classification adopted in many text-books.

[1] Précis de Dermatologie. By J. Darier. Third edition. 1923. Paris: Masson et Cie. Pp. 996. Fr.50.

The modern dermatologists in France would seem to be almost obsessed by two infections—syphilis and tubercle—and the number of conditions which are ascribed by some of them to latent infection with one or other of these diseases is so great as to be almost ludicrous. DARIER himself has recently deplored the tendency of his younger colleagues to concentrate their minds on syphilis to the exclusion of more strictly dermatological problems, but even he, we think, is inclined to exaggerate the importance of tubercle and syphilis and to under-estimate the influence of other chronic infections in the ætiology of eruptions of doubtful origin. This question arises chiefly in connexion with the rather heterogeneous group of eruptions which in 1896 DARIER classed together under the term "tuberculides"; in this group he included lichen scrofulosorum, papulo-necrotic tuberculides (folliclis, acnitis, &c.), the various forms of sarcoid, lupus erythematosus and lupus pernio, and the erythema induratum of Bazin. Other authors have since, with little justification, attempted to enlarge the group by including such conditions as erythema multiforme, pityriasis rubra pilaris, the pityriasis rubra of Hebra and Jadassohn, angiokeratomata, and certain forms of parapsoriasis. On the other hand, it would appear from the work of LANDOUZY and others that erythema nodosum, though probably, as a rule, a manifestation of rheumatic or streptococcal infection, may be a true tuberculide. Moreover, the researches of JADASSOHN and his pupils, and more recently of BLOCH, have shown that in cases of deep trichophytosis there may occur a variety of toxic eruptions—trichophytides—which are morphologically similar to some of the above; they include a follicular eruption resembling lichen scrofulosorum or lichen spinulosus, an erythema scarlatiniforme, an erythema multiforme, and an erythema nodosum. With regard to lupus erythematosus, although a clinical association with active tuberculosis and the results of experimental animal inoculations point to it being in some cases a tuberculide, there is conclusive post-mortem and other evidence that it is not always so, and even folliclis and erythema induratum, though in many cases undoubtedly tuberculides, may, as the experimental observations of GUY would suggest, in certain patients be produced by embolism with organisms other than the tubercle bacillus. The question is reviewed and discussed by DARIER, and he now proposes to substitute for the term "tuberculides" that of "tuberculoides," for he concludes that these eruptions represent a syndrome, which can arise from various causes, and that, although tuberculosis is the commonest ætiological factor, other infections, particularly syphilis, may give rise to them. He says that the work of RAVAUT, TZANCK and PELBOIS, and PAUTRIER, as well as his own observations, have proved beyond doubt that the complete clinical picture of the tuberculides can be produced by syphilis, and that in this case the Wassermann reaction is frequently positive and anti-syphilitic treatment has a remarkable therapeutic effect. This is particularly true in certain cases of hypodermic sarcoids, erythema induratum, disseminated nodular sarcoids, sarcoid of Boeck, papulo-necrotic tuberculides, and even of lupus erythematosus. DARIER remarks in this connexion that an immediate differential diagnosis between lichen scrofulosorum and a follicular syphilide is often impossible.

With this attitude of mind many English dermatologists will find themselves in disagreement. Quite recently Dr. H. G. ADAMSON has argued that of the enormous number of different cutaneous eruptions

that we recognise, each has its own distinctive features—for example, the morbilliform rash of measles, the rose spots of typhoid, the eruptions of scarlet fever, of chicken-pox, of secondary syphilis, of lichen planus, of pityriasis rosea, of psoriasis, &c. And he points out that when we *do* know the cause of a cutaneous eruption, which has its own individual character, we find it to be due to a specific causative agent, such as the typhoid bacillus, the tubercle bacillus, or the *Treponema pallidum*. Is it not therefore logical to suppose that in other equally distinctive eruptions there must be a specific causal organism for each one? Now this is a very suggestive argument and merits every consideration, but it seems to us that it may be pushed too far. No one can doubt that pityriasis rosea, for example, is a distinct entity due to infection with a specific organism as yet undiscovered. The same is true of the exanthemata, and probably of lichen planus. But certain eruptions, equally distinctive as regards their clinical appearances, are certainly not distinct entities from an ætiological standpoint. Urticaria and eczema, for example, may be due to a variety of causes both external and internal. Erythema nodosum, like erythema multiforme, with which it may be associated, is certainly in some cases due to infection with a streptococcus. Yet, as has been said, it would in others appear to be a tuberculide or a trichophytide. Again, it is difficult, in view of clinical and experimental evidence, to deny that lupus erythematosus is sometimes a tuberculide, but there is equally conclusive evidence that it may be a manifestation of acute or chronic streptococcal infection. It would also, we repeat, appear likely that the various papular and nodular necrotic lesions, which are in most cases rightly considered as tuberculides—i.e., inflammatory reactions around emboli of tubercle bacilli carried to the skin or subcutaneous tissue from some distant tuberculous focus—may also be provoked by emboli of other organisms. They occur only in persons of a definite type with a feeble peripheral circulation, and in these subjects there is no reason why a chronic bacteriæmia with any infective organism should not give rise to them.

To sum up, although with Dr. ADAMSON we deplore the tendency manifest in some quarters to neglect accurate clinical and histological observation, and vaguely to ascribe widely different eruptions to latent syphilis, tubercle, or focal infection on quite insufficient grounds, there is no question that certain forms of eruption are merely cutaneous reactions which may be provoked by various infective organisms, and it is only by exhaustive investigation in each individual case that the actual cause of such an eruption can be determined.

VERTIGO AND FEAR.

AN article by Dr. W. F. MENZIES in our present issue, showing that what we call vertigo should be considered as a combination of physiological and psychological processes, opens up many vistas, like every approach to the problem of body and mind, and introduces a subject of immediate clinical interest. Of the five processes which he describes as resulting in vertigo, three—the peripheral stimulus, the vestibular stimulus, and the response from plain and striped muscle, are physiological; the next process—emotion, belongs more to the sphere of psychology, though the Lange-James theory expresses it in physiological terms, and the last—the realisation of the emotion in consciousness, is only expressible as a process of mind. Dr. MENZIES is, perhaps, restricting himself to one part of a problem when he decides that emotion is excited in order that awareness of the danger of falling may be aroused in the organism, vertigo arising only as an emotional outflow of instinctive fear. That other bodily disturbances besides those causing vertigo can induce a state of fear is illustrated by Sir CLIFFORD ALLBUTT'S note in our issue of April 26th, in which he describes a sufferer from pulmonary thrombosis as having "the appealing look of a man in dread," though there was present neither pain nor dyspnœa. A process which resulted in fear was initiated by the physical condition, and one can conceive some of the concomitants of vertigo—the anxiety, nausea, sweating, chilliness, and final collapse—as likewise indicating the presence of fear rather than as part of the primary symptoms. But that the fear should be specifically related to the danger of falling does not seem so certain. Fear is not necessarily a concomitant of vertigo, and Dr. MENZIES gives examples of vertigo without fear. That produced by inhaling the smoke of the morning cigarette is, we may assume, not unpleasingly fearful (it may be observed that a modicum of fear is to some people a desired sensation); the vertiginous bricklayer who freely mounted ladders had certainly divorced the emotion of fear from his subjective troubles. Children, moreover, find enjoyment in inducing vertigo, though many adults find anything but pleasant an attempt to return to the childish pleasure of the swing. Actual danger of falling is not often followed by the syndrome, and the beginner on horse or bicycle may be fearful in the extreme but experience no vertigo.

It appears that Dr. MENZIES'S separation of processes might be carried still further; on the one side are the stimulus and its perception qua stimulus, and on the other are the results of that perception showing themselves in many and varied unpleasing sensations with their bodily accompaniments; and this separation has its clinical counterpart inasmuch as one group may occur without the other. This leads us to the question of definition, and we are compelled to ask which of the groups is indicated by "vertigo." The same question presented itself to BONNIER, who wrote [1]: "One can say, it seems, quite safely, that vertigo seems to be a complex disturbance which appears on the occasion of a sensation or illusion of movement or falling; and inversely, when it appears for any cause whatever, it is accompanied, among other symptoms, by an illusory sensation of movement or falling." This suggested reversibility is shown in those nervous patients in whom vertigo accompanies or takes the place of an attack of pathological fear. Even in healthy people the vertigo that occurs on heights can hardly be expressed in any other sequence than one in which apperception of danger occupies the first place. Although Dr. MENZIES compares his with the Lange-James theory, which, by the way, is far from generally accepted by psychologists, yet it must be noted that the latter theory does no more than express the mode in which the apperception of danger produces those bodily changes upon which the emotion depends. A child on a railway track may perceive an approaching train without any Lange-James reaction if the danger is not recognised. In such a case as that described by Sir CLIFFORD ALLBUTT the gross pathological state may well have induced a sense of impending disaster which in its turn set up the train of bodily changes resulting in the emotional state of the patient; and this sequence differs from that postulated by Dr. MENZIES, in which conscious realisation comes last. It is an

[1] Le Vertige, Paris, 1904, p. 31.

extension of the theory to assume that, in the absence of a mental stimulus except as an end-result, bodily processes of themselves can induce a specific emotion. Dr. MENZIES describes a defensive emotion, with adrenalin outflow and the rest, which is registered in the thalamus and thereafter conveyed to the cortex, but in the classical experiments of CANNON and CRILE the cortical stimulus, the apperception of danger, preceded the adrenalin outflow. Whether this reaction is reversible is a matter of clinical importance, and the way in which it is regarded rather sharply separates the school which seeks the explanation of pathological fears primarily in mental processes and that which sees their origin in physical disturbances in which the endocrine organs are probably concerned. Dr. MENZIES has succeeded in raising a problem of considerable interest.

ISOLATION OF THE VIRUS OF FOOT-AND-MOUTH DISEASE.

A RARE example of a reward for steadfast concentration on one problem by one man is to hand in the news that the virus of foot-and-mouth disease has at last been isolated by Prof. Paul Frosch, Professor of Dietetics and Bacteriology in the Königliche Tierärztliche Hochschule in Berlin, working in conjunction with Prof. Dahmer. More than 20 years ago Frosch, working with Loeffler,[1] discovered that a filtrable virus was responsible for foot-and-mouth disease. Frosch has worked at this subject with persistent diligence ever since, and at a meeting of the Berlin Micro-Biological Society on April 7th he was enabled to announce the discovery of a tiny bacillus which he has isolated and from which, we understand, he has been able to reproduce the disease after 13 subcultures. The organism is only 0·1 micron long in its longer axis. It forms minute colonies, on a suitable solid medium, of the diameter of a red blood corpuscle—that is, 7 to 8 microns. This bacillus the two workers generously propose to name *Loeffleria nevermanni*. Prof. Dahmer described at the same meeting how he succeeded in separating the organism from the fluid of the vesicles and in developing a colony on a solid medium. From these colonies the two workers succeeded in making subcultures with which they inoculated a series of guinea-pigs. The guinea-pigs acquired an immunity which was demonstrated in that, after inoculation, the animals showed no generalised foot-and-mouth disease when subsequently infected with virulent material, though the primary vesicles appeared. These experiments were carefully controlled. From the vesicles of these culture-infected guinea-pigs the organism could be further subcultured. From the experiments it was concluded that guinea-pigs infected with culture material were protected from a generalised disease on subsequent reinfection. The principle of the methods whereby what appears to be a very fine piece of research was achieved bears a curious resemblance to that which gave us insulin. In both cases the problem was that of getting rid of a substance which had a destructive effect on the material to be isolated. It has long been known that the fluid from the vesicles of infected animals is extremely infective on the first day, considerably less so on the second, and that on the third day its potency appears to be lost. Similarly, if an attempt be made to cultivate this fluid, its infectivity diminishes rapidly. The difficulty was to devise some means of getting rid of the unknown substance which kills off the virus. Frosch apparently took the vesicular fluid and filtered it through a collodion filter, and then was able to wash the organism off this filter and grow it, but the actual technique of the culture process has not at present been disclosed. The investigators are taking steps to have their work confirmed at the Department of Health and at the Robert Koch Institute. The economic value of this discovery, if, as seems likely, it will be confirmed by subsequent workers, will be really immense. We await further information on the subject with the keenest interest.

[1] Report of the Commission for Investigation of Foot-and-Mouth Disease at the Institute for Infectious Diseases, Berlin. See Jour. of Comp. Pathol., 1899, xii., p. 79.

Annotations.

"Ne quid nimis."

UNLIMITED INDEMNITY.

THE following letter has been sent to all registered medical practitioners in England, Wales, Scotland, and Ireland by the two great Defence and Protection Societies, and, it will be seen, that these bodies have now decided to offer an unlimited indemnity to their members who may be mulcted in legal damages:—

30th April, 1924.

DEAR SIR OR MADAM,—Recent events have emphasised the extreme importance of every member of the profession being adequately protected in the performance of his duties.

Medical practitioners are reminded of the advantages attaching to membership of one or other of the above-named societies. Members of either body have the benefit of having their cases considered by an experienced council, as well as of being advised both generally and legally on all matters connected with the practice of their profession. Many claims are immediately withdrawn when it becomes known that the practitioner concerned is a member of one or other society. Every day the secretaries of the two societies are engaged in giving advice to their members without expense beyond their annual subscription.

Members of these societies are not only entitled to ask for assistance in the defence of actions brought against them, but the societies frequently institute actions for the protection of the interests and professional reputation of members.

The councils of the two societies have now decided to afford their members unlimited indemnity against damages and costs of the other side on the same conditions as at present prevail.

Yours faithfully,

Signed on behalf of the Medical Defence Union, Ltd.,	Signed on behalf of the London and Counties Medical Protection Society, Ltd.,
WALTER G. SPENCER, President.	JOHN ROSE BRADFORD, President.
SEYMOUR TAYLOR, Treasurer.	CHARLES M. FEGEN, Treasurer and Chairman of Council.
JAMES NEAL, General Secretary.	HUGH WOODS, General Secretary.

Although this action is obviously a result of the Harnett case, still under adjudication upon appeal, it may be said that hitherto the limit fixed by the Societies concerned has been well outside the amount of any indemnity required and that the ideal of putting no limit to the indemnity has always been aimed at.

THE INDIAN (SUBORDINATE) MEDICAL DEPARTMENT.

WE are informed that meetings of the domiciled European community in India are being held to protest against the circular issued by Indian Army Headquarters regarding the reduction or abolition of the Indian Medical Department, and the Anglo-Indian Association, London, has taken the matter up by requesting the Secretary of State for India, Lord Olivier, to hold an official inquiry on which the Anglo-Indian and domiciled European community should be represented. This department was originally intended to be recruited from the sons of persons of pure or mixed European blood and has had a long and useful career. Its members were originally styled apothecaries and the department afterwards included the hospital assistants. The former were employed with British troops and the latter with Indian units. Something more than a quarter of a century ago the apothecaries were given the title of assistant surgeon and a decade or so later the hospital assistants obtained the title of subassistant surgeon.

Later still the department—long styled the Indian *Subordinate* Medical Department—lost the objectionable word subordinate, and now, it seems, the department is to go altogether. The assistant surgeons performed the duties of orderly medical officers in British hospitals and carried out not only the duties of wardmasters and dispensers, but many of the less important medical functions of junior officers and all the duties of quartermasters of the R.A.M.C. It is difficult to see how the abolition of the department will effect economy, as in addition to their military duties assistant surgeons were recruited for many civil appointments, while a few obtained British qualifications and entered the Indian Medical Service. Sir Patrick Hehir started his distinguished career in the ranks of the old I.S.M.D.

A MATTER OF TASTE.

OUR attention has been drawn to a signed article in a daily paper entitled "A Parliament of Neurasthenics," wherein a Medical M.P. discusses the alleged nervous condition of his colleagues. He deduces from such mannerisms, neuro-muscular symptoms and vaso-motor instability as his trained observation of Members has detected that many of his colleagues suffer from neurasthenia in some form. With the accuracy of his pathological interpretation of characteristic movements and manners we are not concerned, although it is natural that in legislators dealing with affairs of great moment outward signs should appear of the inward conflict. It has, however, been suggested to us that members of the medical profession would be wise to be at least as discreet in their observations in the House as they would be in a friend's drawing-room. Articles from a tailor who happens to be a Member of Parliament, criticising the cut, materials, and degree of seniority of the clothes of his neighbours, would be open to a charge of bad taste, and it is doubtful whether the estimation of the extent of mental and physical deficiencies on the part of a medical Member is in better taste. Doctors in Parliament have certain privileges granted to them on account of their professional status and ethic which it would be a pity to forfeit.

THE CORRECTION OF SPEECH DEFECTS.

AFFECTIONS of speech, complicating the apparatus concerned in the production of a normal voice, are so various and frequent that, until recently, it has been something of a reproach to the medical profession that facilities for dealing with them have not been more adequately provided. Twenty years ago the routine treatment of functional aphonia was to stimulate the larynx by the internal or external application of the faradic current, or by painting the glottis with a solution of chloride of zinc or some other irritating solution. This often succeeded in restoring the voice for a time, but the aphonia usually soon returned, and with each relapse treatment became more uncertain and the patient more despondent. The modern method consists in obtaining the coöperation of the patient, and in educating him in the proper use of the various groups of muscles concerned, when the result is usually a lasting cure. So, also, many cases of chronic laryngitis and pharyngitis, which are maintained in a vicious circle by improper and excessive use of some of the muscles of voice-production, are amenable to treatment by vocal education. Stammering, as is well known, is curable by similar methods. In addition to these and similar functional disturbances, defects of speech due to physical causes can be greatly improved by educative treatment; such are cleft palate, speech affections due to hemiplegia and to operations about the larynx and pharynx, while the defective speech which results from severe deafness can also be bettered by similar methods. It is, therefore, all to the good that this has now been recognised, and that the speech clinic which has been working at St. Bartholomew's for the last 13 years has now its counterparts at Guy's, St. Thomas's, Great Ormond-street, and the Royal Dental Hospital—we are not sure that the enumeration is complete. There is also a strong medical element in the administration of the Vocal Therapy Fund, which was founded for the restoration of health through speech, song, and correct breathing. Sir Bryan Donkin is chairman of this Fund, and other medical names on the committee are those of Dr. M. Flack, Sir J. Dundas-Grant, Sir Frederick Mott, Dr. C. S. Myers, F.R.S., and Dr. Jane Walker.

THE ARGYLL ROBERTSON PUPIL IN NON-SYPHILITIC CASES.

SPEAKING in the discussion on the Physiology and Pathology of the Pupil Reactions at the Annual Congress of the Ophthalmological Society of the United Kingdom, reported on p. 968, Mr. R. Foster Moore opened up a most important and interesting question—namely, the value of the Argyll Robertson pupil as an indication of past syphilitic infection. We have become so apt to associate this phenomenon invariably with tabes or general paralysis, that it is slightly disconcerting to read Mr. Foster Moore's series of cases in which it occurred apart from any other demonstrable lesion of the central nervous system, and without any possibility of the presence of syphilis. It is true that such cases show slight differences from the typical Argyll Robertson reaction, but these may be difficult to elicit. The most important points to note are, firstly, that what we may call the "false Argyll Robertson" pupil may be present from birth onwards and may be unilateral. Again, in all the cases, the reaction to accommodation, though present, was very sluggish, the accommodative power, however, remaining normal. The whole question is most important and calls for a much fuller investigation of the causes of the true Argyll Robertson pupil. We do not yet know either the actual cause of this or the anatomical site of the lesion, nor is opinion yet unanimous even on the subject of the central paths of the normal pupil reactions. There is a vast field for research here still, and it is to be hoped that neurologists and ophthalmologists will turn their attention anew to the subject of the central connexions of the visual tracts.

MALTA FEVER IN AZERBAIJAN.

RUSSIA has recently been the prey of terrible epidemics, from which nothing can save the country except consistent hygienic administration informed by scientific work. A recent article[1] from the bacteriological laboratory of the State University at Baku is an example of such work. Dr. P. Sdrodovski gives an account of the very thorough investigation he made when he diagnosed a hitherto unrecognised case to be Malta fever, a disease never recognised before in Azerbaijan. The patient, a lady, had been ill for two months with persistent irregular pyrexia, headache, pains in the joints, sweating, and loss of weight. Her spleen and liver were enlarged; she had leucopenia and monocytosis. In September blood culture showed a micrococcus closely resembling *Micrococcus melitensis*, agglutinated by the serum of the patient in a dilution of 1 : 1000. It was found that the patient's mother was also suffering from a similar attack (at first thought to be malaria), and her blood agglutinated this micrococcus (1 : 500). They had become ill almost simultaneously on leaving Perebedil (a village in the Eastern Caucasus a hundred miles from Baku), where they had spent May and June, and where both had drunk much raw goats' milk. At the end of September an expedition to Perebedil was organised to clear up the epidemiology of the disease. The blood of 30 natives with pyrexia was examined, and two (only) were found to agglutinate the micrococcus—one (the owner of the goats, with persisting fever and pains in the ribs) in 1 : 2000; the other (his brother, with persisting fever and swelling of a knee), in 1 : 500. Six of the milch goats were examined; the blood of two gave positive

[1] Archiv für Schiffs- und Tropen-Hygiene, xxviii., 1.

results (1 : 200, 1 : 1500); both looked healthy, the second, in December, was found to have a swelling in the knee-joint of a foreleg. Two other cases were subsequently found in Baku, unrelated in any discoverable way to the others or to Perebedil, which is not, therefore, the only centre of the disease in the country. The organism found was pathogenic to rabbits, 3 of 10 died; of rats, 7 of 10; of mice, 3 of 4 died within three days, and it was deadly for guinea-pigs. Post mortem it was recovered from the spleen and other organs in pure culture. Rabbits showed high agglutination (1 : 10,000) but, like goats, showed no characteristic symptom if the case became chronic. One hundred and fifty other pyrexial cases in Baku were examined, but no other gave agglutination at 1 : 100 dilution. The rabbit serum sent by Dr. Sdrodovski to Hamburg agglutinated standard cultures of *M. melitensis* there up to 1 : 3200, normal rabbit serum being negative.

THE LIMITATIONS OF CHEMICAL ANALYSIS.

THE necessity for rigorous biological testing of drugs such as pituitary extract, insulin, and salvarsan, which has given occasion for a Therapeutic Substances Bill, draws attention to the limitations of purely chemical testing and standardisation in the case of complex drugs of unknown chemical nature. In dealing with pure chemical compounds of known constitution, chemical methods of testing are generally quite sufficient and satisfactory as well as being usually more rapid and simple to carry out than biological tests. But in cases such as pituitary extract and insulin where the chemical nature of the active principle is quite unknown, biological methods are absolutely necessary. In other cases, such as ergot, where several active principles have been isolated and their chemical constitution accurately established, biological methods of testing are still advisable, as no simple satisfactory chemical tests are available for the amount and purity of the chemical components. Salvarsan, on the other hand, is usually regarded as a single pure chemical compound, but it is extremely doubtful whether the ordinary technical product is ever the pure substance represented by the formula assigned to salvarsan. Even if it were, this substance undergoes oxidation so readily that the need for careful testing and control is at once revealed.

The limitations of chemical analysis are rarely sufficiently appreciated by the layman. The analyst is frequently requested to find out the detailed composition of a complex mixture of ill-defined organic substances by "analysing" it, as though there were a standard routine method available by which all the components of any material could be determined. One reason for this confusion of thought is to be found in the difference between inorganic and organic analysis. With sufficient skill, care, and patience it is usually possible to ascertain accurately the composition of any inorganic mixture, but the majority of substances dealt with in everyday life are mixtures of a large number of organic compounds, usually of complex and little known chemical nature. It is no disparagement of the skill and science of analytical chemists to say that accurate analysis of such mixtures is impossible. Indeed, it is remarkable with what skill chemists have devised methods and tests to enable them to find out a very great deal of the nature of the complex materials presented to them. Nevertheless, many of these tests are to some extent empirical and depend for their utility largely on being carried out in a standard manner.

The need for standardisation of analytical processes, especially in dealing with organic substances such as foods and drugs, is vigorously set out in a recent paper by Mr. M. S. Salamon, which appears in the current issue of the *Analyst*. Examples were given during the discussion at the Society of Analysts which ensued on the reading of this paper. For instance, a sample of dried milk was investigated by different analysts, of whom two found 40·6 per cent. and 40·7 per cent. of lactose, whilst a third, using a different method from the other two, found only 38·6 per cent. The last-named method by a different process of calculation gives 40·6 per cent. of lactose, and it certainly seems desirable that the methods should be standardised sufficiently to avoid such large discrepancies in a comparatively simple estimation. Still more unsettling is the statement that the percentage of lactose given in an analytical report sometimes refers to the anhydrous substance and sometimes to the hydrate. In this case a definite convention should certainly be established. In the estimation of fats in milk and dried milk, some methods give consistently lower results than others, though in this case the difference is not usually so large as in the case of lactose. Even if a standard process for the estimation of fats be not agreed upon, it is desirable that the process used should always be stated so that it may be seen if results are strictly comparable. Different results are given by the various methods of determining phenols and aldehydes in essential oils; even in the case of inorganic materials the results may depend to some extent on the nature of the process. Imperfections such as these do not discredit chemical analysis; the limitations of analysis, however, should be borne in mind, and it should not be expected to accomplish the impossible.

TREATMENT OF PERNICIOUS ANÆMIA BY EXCAVATING THE BONE-MARROW.

THE bone-marrow, as well as the spleen, showing certain definite changes in pernicious anæmia, it is natural that the occasional successes following splenectomy for this disease should suggest the idea of removing the bone-marrow from the long bones. Recently this idea has materialised in Berlin, where Prof. Walterhöfer and Dr. Schramm have already operated on as many as 23 cases of pernicious anæmia during a period of little more than two years. Their achievements are so promising that they have already extended their indications for this operation, which was at first attempted only in those cases in which other older methods had failed. In a recent publication [1] they refer only briefly to the technique,[2] stating that at the suggestion of Prof. Bier they have substituted irrigations of the long bones for their original scraping operation, a current of fluid being passed through small holes bored in the tibiæ. It was noted with surprise that even almost moribund patients tolerated this operation well, and it was found feasible to evacuate the marrow of several long bones at a single operation. As good results were obtained in 48 per cent. of the cases which had been refractory to other treatment, it is claimed that the improvement effected could not be dismissed as a mere coincidence. Pernicious anæmia is notorious for its capriciousness, remissions often occurring unexpectedly and lasting a considerable time. But as the improvement observed in many of the 23 cases occurred directly after the operation, the authors dismiss as improbable the explanation that they were dealing with coincidences, and they believe that their procedure has already earned a noteworthy place in the treatment of pernicious anæmia. They have accordingly extended their indications for this treatment, which they sometimes vary with other treatments, such as arsenic medication and blood or serum transfusion. In support of this variation of treatment, they suggest that bone-marrow evacuation is but one of many means by which the regenerative processes in the body can be stimulated, and that varying the stimuli from time to time is all to the good. In cases coming to necropsy it was found that extensive regeneration of the evacuated bone-marrow had taken place, leucocytes and erythrocytes in all stages of their development being found in the new marrow. The regeneration of fat in the marrow was comparatively slight. Even when the disease steadily progressed, and the patient died, it was found that faultless regeneration of the

[1] Acta Medica Scandinavica, 1924, lx., 196.

[2] The technique of the operation was originally described in Archiv für klinische Chirurgie, Bd. cxvii., 1921.

marrow had taken place. The operation does not seem to be very dangerous, but of the durability of its achievements there must still be doubts.

THE PRESENT EPIDEMIC OF LETHARGIC ENCEPHALITIS.

THE anticipations of the Ministry of Health in 1919 that epidemic encephalitis was likely in the future to manifest its activities in wider epidemic form appear to be only too truly realised. The seasonal incidence of encephalitis in England and Wales has been unduly high, the number of cases of the disease notified since the beginning of the year being 1612, compared with 1025 during the whole of 1923, 454 in 1922, 1470 in 1921, 890 in 1920, and 541 in 1919. In all other European countries, as well as in the United States of America, the first quarter of 1924 has shown improvement on the corresponding quarter of 1923. The returns for the week ending April 26th now show a decline in the number of notifications for England and Wales from 253 to 210. The fall has been marked in the chief centres of infection: Sheffield returns 26 cases as against 41 in the preceding week, Birmingham 17 as against 29, Newcastle 3 as against 7, and Bristol 8 as against 13. There have also been an appreciable number of sporadic cases in rural and outlying districts. In Liverpool and Sheffield several examples of multiple cases in households have occurred and the recognition of mild or abortive cases, characterised by transient palsies, stiffness of the neck muscles, febrile attacks, sore throats, or mild catarrhs is seen to be of importance in tracing the paths of case-to-case infection. On the whole, the clinical type of case seen in the present outbreak appears to be of a relatively mild degree of severity. In Sheffield out of 163 cases notified since March 10th, 20 deaths have occurred. In many instances the prodromal period of infection appears to be over the usual seven days. Many patients have a febrile onset often ascribed to "influenza," and a fortnight or more elapses before the definite signs of encephalitis are manifest. Whilst a proportion of cases can be classed as the original oculo-lethargic type or present the Parkinsonian phenomena seen in 1918, it is noteworthy that many of the cases show myoclonic movements and that fibrillary twitchings of the abdominal muscles are also common. Cortical affections are more frequently seen than in previous outbreaks; these are characterised by epileptiform convulsions sometimes associated with maniacal outbursts or insomnia. Catalepsy is rare in the present outbreak. Some patients make an unusually rapid recovery.

THE ATTEMPT TO ASSESS PHYSICAL FITNESS.

THE results of certain investigations conducted during the war gave rise to the hope that by an appropriate treatment of measurements long familiar to physical anthropologists and physicians (measurement of body dimensions and of vital capacity) it might be possible to obtain simple and widely applicable methods of assessing physical condition. The Medical Research Council have collected then and since much data with the object of throwing light on this point, and though the whole of this material has not yet been analysed, a sufficiently large sample has given negative results. Inquiry as to whether any other less familiar system of measurements or tests might serve to found a rational and accurate mode of judging goodness or badness of physique has led to equally disappointing results. It seems now to be established on grounds of an analysis of measurements of young adult males,[1] in adult women,[2] and schoolboys,[3] of various ages and social class (Mumford and Young) that the inherent variability of vital capacity within homogeneous groups of apparently healthy persons is so great that inference from deviations above or below the normal of a particular combination of measurements will rarely be of service in the assessment of individual cases. In the most recent of the special report series issued by the Medical Research Council Dr. Lucy Cripps has applied to young women engaged in widely different occupations Group Captain Martin Flack's tests for physical efficiency in airmen. Her study has not resulted in the discovery of any simple or generally valid relationships. She is careful to point out that these negative findings do not detract from the value of these tests for the particular purpose for which they were devised and are used—that is, to ascertain fitness for flying. Certain side-issues of the inquiry are of interest. For example, the women subjected to the tests included 115 students at Bedford College, 241 students at a physical-training school, and 125 civil servants. Of the third-named group all, of the first many, and of the second none habitually wore corsets. The conclusion reached confirmed that of other modern observers, that the costal type of breathing at one time thought to be characteristic of women is due only to constriction of dress and that there is no essential difference in the mechanism of respiration in men and women. Another interesting fact is that among students at the physical-training college in three of the tests—vital capacity, breath-holding, and the fatigue tests—those students who have had a longer training show on the whole worse results than those in the earlier stages of training. The suggestion is that these girls may be overtrained in their third year. In connexion with this report the results recorded by Burgess Gordon, S. A. Levine, and A. Wilmaers in the current *Archives of Internal Medicine* on the vital capacity of a group of Marathon runners is of interest; their vital capacities varied a great deal from below to above normal and bore no important relation to the order in which they finished.

[1] Greenwood, Newbold, and Cripps: Biometrika, 1923, xiv., 316.

[2] Medical Research Council Special Report Series No. 84. The Application of the Air Force Physical Efficiency Tests to Men and Women. By Lucy D. Cripps, M.B., D.P.H. 1924. H.M. Stationery Office. 1s. 6d.

[3] Mumford and Young: Biometrika, 1923, xv., 109.

TUTOCAIN.

THE German firm of Bayer, who introduced the substance "205" as a means of treating trypanosomiasis, have now produced a new local anæsthetic known as tutocain. It is a substance of the novocaine type, and a derivative of α-γ-amino-alcohol; it contains two asymmetric carbon atoms, but is nevertheless a racemic combination. It is very soluble and can be sterilised by boiling for a short period without undergoing decomposition. Its pharmacological properties have been described by Schulemann,[4] who states that tests on the eye of the rabbit show that a solution of ½ per cent. strength is potent enough to produce anæsthesia, while the lowest concentrations of novocaine and cocaine able to do so are 2 per cent. and 1/20 per cent. respectively. Thus tutocain would appear 16 times as powerful as novocaine and only two and a half times weaker than cocaine. Its effect is prolonged. Its toxicity, as tested on rabbits by intravenous injection, and on mice by subcutaneous injection, is twice as great as that of novocaine, and, so far as intravenous injection into the rabbit is concerned, about half that of cocaine. When applied to the human eye it produces no irritation, but has the drawback of causing some hyperæmia; this may be prevented by the addition of adrenalin. Various clinical reports of its use have now appeared [5]; all these are entirely favourable, both as regards its use for superficial as well as for infiltration anæsthesia. It has been used in operations for hernia, hydrocele, gastrostomy, colostomy, osteotomy (hallux valgus); also in major abdominal operations by Braun's method

[4] Klin. Wochens., 1924, iii., 676.

[5] Lotheissen: Wien. Mediz. Wochens., 1924, lxxiv., 891; Finsterer: Ibid., lxxiv., 895; Seiffert and Anthon: Deutsch. Mediz. Wochens., 1924, April 25th, 538; Marcuse: Ibid., 539; Suchanek: Wien. klin. Woch., 1924, No. 17, 415.

of splanchnic anæsthesia and also injected into the spinal canal. For nose and throat work, when used in conjunction with adrenalin, it is stated to be just as effective as cocaine. The price of tutocain is the same as that of novocaine; since, however, considerably less is required, it is cheaper than novocaine to use. Up to the present no clinical trials have been made in this country, so that it will be necessary to wait to know to what extent such favourable reports require qualification. Certain preliminary laboratory tests which have been carried out confirm the statement that it is considerably more active than novocaine. It is interesting that the Bayer firm are reported to have expressed the opinion that tutocain will prove the most valuable discovery they have made within the last ten years.

DISPOSAL OF THE DEAD.

FOR 50 years the Cremation Society has advocated the disposal of the dead by cremation, and the report which was read at the annual meeting on April 30th showed how much this practice has gained ground during the last half century. The total number of cremations in Great Britain during the last year was 1986, a decrease of 23 on the figures of 1922, but the report points out that there are many indications of growing interest not only in all parts of the Empire but throughout the world. When full statistics are available it is probable that the ratio which cremation bears to the death-rate will show a marked improvement, and the slight decrease is probably due to the abnormally low death-rate of the past year. The Society has given during the past year considerable attention to the question of death certification, which is intimately bound up with the future of cremation, as was pointed out in our columns recently.[1] Owing mainly to the efforts of the late Sir Malcolm Morris a fully representative committee was formed under the ægis of the Federation of Medical and Allied Services for the purpose of drafting a Bill amending the law of death certification. There is urgent need for a Bill which will leave no room for the certification of death on insufficient information, as can at present take place under the existing laws. The scope of the proposed Bill was outlined in THE LANCET of Jan. 12th last. It is hoped that this Bill will be introduced into Parliament during the present session and, should it become law, it will do much to remove the existing anomalies which prevent cremation from being more widely adopted among the poorer members of the community who at present have no alternative to the common grave. The first crematorium in Wales has been established at Pontypridd, and the question of providing a crematorium for the West of England has again been brought into prominence. It is hoped that a crematorium may be established at Plymouth or some other convenient centre. The provision of a crematorium is also be to considered by the local authorities at Cardiff, Chiswick, Canterbury, and Richmond in Surrey. The disposal of the dead vitally concerns the health and welfare of the living in all classes of the population and is also of the greatest economical importance to the country at large.

THE principal firms engaged in the production of insulin in Great Britain are reducing the retail price of insulin to 5*s*. per 100 units as from May 12th. The present retail price is 6*s*. 8*d*., and is the result of a series of reductions which have taken place since insulin first came on the market here at 25*s*. per 100 units early in 1923.

[1] THE LANCET, Feb. 16th, p. 344.

THE Manager of THE LANCET would like to purchase copies of the issue of Feb. 2nd, 1924, for which subscribers may have no further use. He will be pleased to pay 1*s*. each for them. Such copies should be addressed to him at 423, Strand, London, W.C. 2.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LXX.—INFECTIONS OF THE HAND.

THE great prevalence of hand injuries and the need of obtaining complete restoration of function for wage-earners makes their treatment of great economic importance. The following processes will be dealt with here: (1) Acute lymphangitis; (2) infections of the terminal segment of the fingers; (3) acute tenosynovitis; and (4) the infections of the fascial spaces in the palm. The degree of disability and the time lost from work depend largely upon the early and exact recognition of the type and the site of the infection. Most really bad septic hands are due to faulty diagnosis.

Prophylactic Treatment.—In all industrial works facilities for immediate treatment of minor injuries should be provided. In small works the foreman should be given instruction in elementary first-aid and be put in charge of a small surgical box, while in large concerns a special first-aid dispensary should be established. In the treatment of small cuts, pricks, and skin abrasions no attempt is made to cleanse the wound, which should be liberally painted with tincture of iodine and a dressing applied.

Acute Lymphangitis.

In this condition diagnosis is of the utmost importance, for if it is unrecognised and the finger incised, the general condition of the patient may be seriously imperilled. The finger, following a slight prick some hours previously, becomes slightly swollen with a dull ache, this condition being ushered in by a feeling of malaise or, in bad cases, by severe chill. Within a few hours the tell-tale red line has appeared in the forearm and there may be quite obvious swelling of the dorsum of the hand, though the primary site of infection remains but slightly swollen. The degree of systemic involvement varies very considerably in different cases. Treatment will be directed to the local lesion and to the general condition of the patient. Locally, oft-repeated, large hot dressings will be applied to the whole hand and forearm, while Bier's passive hyperæmia obtained by a Martin's bandage placed round the arm will be found of great service. Generally, the patient must be treated in bed, eliminative measures, such as saline purges and diuretics, must be instituted, and the patient's general condition supported by stimulants. An incision will be required only if a localised abscess develops at the site of infection or in the lymph glands at elbow or axilla. Complete recovery is often rapid, though in a few fulminating cases death cannot be avoided.

Infection of the Terminal Segment of the Fingers.

In these cases, usually, but not always, preceded by a slight prick, a stabbing pain is felt which soon gives place to a severe throbbing pain, sufficient to keep the patient awake. The end of the finger becomes swollen, red, tense, and very tender over the site of infection. The pain, swelling, and tenderness increase, and the swelling will spread down the finger and on to the dorsum of the hand, but the pain and tenderness remain localised to the terminal segment. Treatment consists of an incision on the lateral surface of the finger—never in the middle line—from the distal flexion crease to within half an inch of the tip. This will suffice in early cases, but in severe ones a second lateral incision should be made on the other side and these two joined up over the end of the finger, keeping within a quarter of an inch of the edge of the nail. The flap thus formed should be dissected up so as to open completely the fibro-fatty pocket and a slip of rubber tissue inserted between the flap and the periosteum. This promotes excellent drainage, rapid subsidence of the infection, and complete restoration of function.

Acute Tenosynovitis.

This serious condition may be caused by a crushing accident or by infection carried from a mere scratch or prick. It will be diagnosed by severe pain; by a symmetrical enlargement of the whole finger, with the swelling spreading to the basis of the neighbouring fingers, to the palm, and particularly to the dorsum of the hand; by exquisite tenderness along the whole length of the sheath; by severe pain on passive extension of the finger, especially when the full limit of extension is reached; and by the fingers being held in the semi-flexed position, the affected finger rigidly so. This clinical picture combined with a raised temperature and pulse-rate and general malaise is unmistakable.

The infected sheath must be opened and drained, and only two problems need any discussion—viz., the site and the length of the incisions. The following procedure is based upon A. B. Kanavel's well-known work and has given admirable results. First, an incision is made either in the proximal or in the middle segment of the finger, depending on the site of the original infection. It is placed at the lateral aspect and extends the whole length of the phalanx. The tendon sheath is now laid open, but the part over the joints is left uncut so as to prevent prolapse of the tendon. By manipulation some idea can be obtained of the degree of infection in the unexposed part of the sheath, and if much pus can be squeezed out, then a second incision is made over the previously uncut segment of the finger and the sheath opened there. If the sheath contained very much pus, if the synovial surfaces are severely damaged, or if the swelling of the finger is so great as to obstruct drainage, then the two previous incisions should be joined up and the sheath opened throughout its entire length.

In dealing with the little finger, the extension of the infection into the ulna synovial bursa in the palm is to be suspected, as the sheath and the bursa are usually continuous. The recognition of this extension is by no means easy, but these points will be of use. No marked local swelling of the palm or fluctuation in the palm will occur because of the dense palmar fascia and because the infection breaks through into other structures before these signs are present. One sign is of diagnostic importance—viz., the spread of the area of exquisite tenderness from the little finger sheath to that part of the palm corresponding to the limits of the bursa. The problem is usually not so difficult as it appears, because when the sheath of the little finger has been opened, pressure over the bursa in the palm will cause pus or turbid serum to well up in the wound if the bursa be infected. In this case a grooved director should be passed through the finger incision down the sheath into the bursa. The incision is then made from the distal flexion of the palm to the level of the hook of the unciform; in order to avoid injury to the tendons and to obtain the best drainage the incision should be placed at the ulna border of the bursa.

Similarly, the radial bursa is suspect in infections of the thumb. Early diagnosis is of paramount importance in the thumb because a very large proportion give rise to secondary infection of the ulna bursa as well, thus producing a very grave condition. The signs are similar to those in finger and ulna bursal infections, the line of exquisite tenderness being the most important feature. The sheath is opened by an incision in the mid-line of the flexor surface of the thumb opposite the proximal phalanx. It is then continued in a gradual curve over the prominence of the thenar mass, ending half an inch distal to the lower margin of the anterior annular ligament. The sheath is reached by separating the two heads of the flexor brevis pollicis.

Infection of the Fascial Spaces of the Palm.

The middle palmar space lying immediately in front of the metacarpal bones of the middle, ring, and little fingers and the corresponding interossei muscles, and immediately behind the tendons in the palm, is subject to secondary infection from these three fingers, from their tendon sheaths, from the ulna bursa, and from the three lumbrical canals, as well as by direct trauma. Infection of this space is characterised by such swelling that the normal concavity of the palm is obliterated, and by tenderness over the surface area of the space. An abscess in this position may be drained on either side of the ring finger, and the guide to it is the corresponding lumbrical muscle. The decision rests with the site of the original infection, or the situation in which the pus is obviously coming to the surface; where there is any doubt the lumbrical canal between the middle and ring finger is chosen as giving the best drainage. The incision starts in the web between these two fingers and ends half-way between the distal and middle flexion creases of the palm. This opens the canal, and a pair of sinus forceps following the muscle and passed beneath the tendons will open the space, drainage being ensured by a strip of rubber tissue.

The thenar space lying on the anterior surface of the adductor transversus pollicis muscle, therefore, lies to the radial side of the middle metacarpal. Its infection may be recognised by the great swelling and tenderness of the thenar eminence. The space is opened by an incision in the dorsum of the hand along the radial side of the index metacarpal corresponding to the shaft in length. The lower border of the adductor transversus can readily be identified, and sinus forceps being passed along the palmar surface of the muscle the space is drained.

I would emphasise that in both these conditions, as indeed in every septic finger and hand, the swelling of the dorsum of the hand is most noticeable.

Operative Technique.—After-treatment.

(1) Incisions should be made under general anæsthesia; nitrous oxide alone is not suitable. (2) A tourniquet should always be used—preferably the arm compressor of a sphygmomanometer. (3) Drainage may best be obtained by rubber tissue wicks or paraffin flavine gauze—tubes should never be used. (4) No incision should be made until the surgeon has made up his mind exactly where the pus is, and exactly at what anatomical structure he is aiming. (5) No incision should ever be made upon the dorsum of the hand till every other possible site of pus elsewhere in the hand has been eliminated. Swelling of the dorsum is present in every septic hand, and incisions here do no good, only harm. (6) At the end of the operation it is often very useful to release the pressure in the arm compressor until passive congestion is obtained. This may be kept up for three hours.

All these conditions are best treated by hot boric fomentations for 48 hours, after which time small flavine dressings to the wound and light dry dressings should be used. In very bad cases baths of iodine (one drachm of the tincture to a pint of water) at 110° F. will be found soothing to the patient and useful in clearing up the worst of the infection. They should be used twice a day for 20 minutes at a time. I am of opinion that two further measures are of superlative importance: (1) To bake the hand in hot, dry air with radiant heat twice a day from the time dry dressings are being employed. Messrs. Weiss have designed a special box for me for radiant heat treatment of these hands. (2) Most important of all, after adequate drainage, is the institution of active movements at the earliest opportunity. The principle is the same as that introduced by Willems in the treatment of acute infective arthritis. Patients should be encouraged to move their fingers as early as the third day, and it will be found that they will do this at first most confidently while the hand is in the radiant heat bath. For this reason dressings should be as light as possible. If movements are encouraged as one of the recreations of convalescence no stiff fingers will result, and secondary operations, the use of typewriters, pianos, and various ingenious devices will not be needed.

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Special Articles.

ANNUAL CONGRESS OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

THURSDAY, MAY 1ST.

THE opening meeting of the Congress took place on May 1st at the University, Glasgow, Dr. R. Maitland Ramsay, the President, in the chair. After Principal Sir Donald MacAlister had welcomed the Society to Glasgow and the University, a discussion took place on the

Physiology and Pathology of the Pupil Reactions.

Sir John Parsons dealt with the anatomy and physiology of the pupillary mechanism. He referred to the work of Anderson and Lange, and stated some essential points in the embryological and comparative anatomy of the region. He dealt with the factors upon which the pupillary reaction to light depended. He pointed out that recent work goes to prove the theories that the constrictor centre is situated near the anterior and inner end of the third nerve nucleus, that the centre for convergence is on the inner aspect about the middle, and that the accommodative fibres are centred at the posterior end of the nucleus. The superior colliculus in man has developed proprioceptive functions and fibres connect it with the vestibule. It may have connexion with the pupillary reactions. The dilator centre was believed to be near the third nerve nucleus, but recent research places it higher up, and some believe that it is behind the optic radiation and lateral to the infundibulum. The mechanism of the pupil is exceedingly complicated, it is in a constant state of unstable equilibrium, and the whole problem presents many difficulties.

Dr. Edwin Bramwell approached the subject from the physician's standpoint. The physician is concerned with eye symptoms in relation to general disease, the ophthalmologist with eye symptoms in relation to local disease. The eye symptoms in general medicine have more relation to the anatomical situation of the lesion than to its actual pathology. The physician seeks the diagnostic value of symptoms and does so in two ways, first by co-relating clinical signs with pathological findings, and secondly, by analytical study of the sign and its associated phenomena. He must never forget that an eye symptom may be present as a local manifestation, and must beware of associating it with a general disease; also a symptom may be present which is common to two conditions—e.g., a man may have myosis and an intrathoracic aneurysm, but the myosis may be due to locomotor ataxia. Argyll Robertson's famous paper was published in 1869. The sign described first by him has been reported in cases of disseminated sclerosis, encephalitis lethargica, also following trauma to the head or eyes.

Mr. R. Affleck Greeves drew attention to the alterations in the size of the pupil in relation to age. The infantile pupil is small, the adolescent large, and thereafter the pupil gradually gets smaller as the individual gets older. The small pupil of old age is due, he believes, to a stiffening of the iris and particularly of the blood-vessels. He quoted statistics showing that 4 to 10 per cent. of perfectly healthy people have unequal pupils. Enlargement of the pupil is present in many conditions. In glaucoma simplex the pupil is unaffected, in long-standing cases it is dilated, and he emphasised especially the oval pupil which is found in subacute cases and which he regards as being diagnostic. A small pupil is got in trauma when a penetrating wound is present which allows the intra-ocular tension to fall. In diabetes œdema of the pigment layer occurs which accounts for the sluggishness of the reflexes in that disease. Flattening of the pupil occurs in traumatic iridodialysis and is also an important sign of intra-ocular tumours, especially malignant ones. He quoted some very interesting illustrative cases, particularly one of a girl in whom the left pupil went through a rhythmical cycle of dilation and contraction combined with drooping of the upper lid.

In the subsequent discussion Mr. E. Treacher Collins gave a short account of some of his work on the iris, which he illustrated with numerous slides; amongst others, he demonstrated the complete absence of sphincter fibres in congenital myosis. He pointed out the curious developmental relation of the iridic and ciliary muscles, the former being epiblastic, the latter mesoblastic in origin. In certain lower animals the mechanism of pupillary reaction is entirely local; in the higher ones it is a complicated reflex process. Mr. Inglis Pollock showed a number of slides illustrating the presence of supplementary ciliary ganglia in cats and dogs. He gave an account of his work in excising the ciliary ganglia of rabbits and the subsequent action of drugs such as pilocarpine, pituitrin, and adrenalin on the pupil reaction. Mr. R. Foster Moore contributed an account of several cases of what he called non-luetic Argyll Robertson pupil. In four of them the condition was unilateral. The essential features were normal fundi, reaction to light lost, very slow contraction and relaxation on convergence, full dilation with mydriatics, presence of the knee-jerks, no history or evidence of syphilis, and completely negative physical examination. Mr. Leslie Paton pointed out that the spirochætes lay dormant in interstitial tissue and that in locomotor ataxia they were found lying in a fold at the exit of the posterior roots from which they attack the parenchymatous tissue. He suggested that a possible origin near the area involved in an Argyll Robertson pupil was to be found in a little pocket of interstitial tissue situated behind the pineal body.

In the afternoon Prof. Graham Kerr read a paper on

An Experiment in Binocular Vision.

There are, he said, three advantages of having two eyes; firstly, the individual has a spare one in case of accident; secondly, he has the advantage of binocular vision; and thirdly, he obtains an increased intensity of mental impression. It was to convince himself of the truth of the third point that he designed the experiment. He made a white figure on a black background. The figure he chose was the shape of a four-leaf clover and was about four inches in size. He held this figure about 18 inches from his eyes and by focusing upon a point beyond that distance he produced two images. By bringing his point of focus nearer he could make the two images come closer together and ultimately to overlap. He found when two leaves completely overlapped that he obtained a relatively more intense image. All attempts to measure this intensity failed owing to the unknown psychical factors involved. In his opinion the experiment showed that there is a summation of the images seen by both eyes, similar to that which occurs in animals possessing dozens and even hundreds of eyes, such as slugs, winkles, and sea-urchins. It is difficult to believe that these animals get hundreds of separate impressions of the same object if there is no summation of the images.

Sir Arnold Lawson reported a case of

Bilateral Symmetrical Detachment of the Retina with Normal Vision.

The patient was a woman of 45 who, in 1915, had a severe fall with injuries to her back and head; she was laid up for a short time, but recovered completely. She was given glasses for presbyopia in 1918 and again in 1922. In February, 1923, she complained of shadows over the right nasal field, and ophthalmoscopic examination showed a detachment of the retina on the outer side of the right eye. The rest of the fundus was normal. She was ordered to bed, and on examination a similar but less extensive detachment was found in the left eye; both eyes with presbyopic correction had normal vision. Thorough medical, radiological, and rhinological examination showed no abnormality. Since coming under observation she has

had faint turns on several occasions; during these attacks she felt dizzy and fell down two or three times. They were put down by a neurologist to the occurrence of the menopause. They have not altered her retinal condition, which is exactly the same just now as when first detected in February, 1923. Mr. Hepburn suggested that the condition might be due to hæmorrhage.

Prof. Snellen (Utrecht) spoke on

Diplopia and Strabismus.

His remarks were concerned chiefly with concomitant convergent strabismus. He thought that all would agree with him in saying that the present operative treatment of squint was unsatisfactory, that advancement and tenotomy, although successful in a certain proportion of cases, frequently left the patient no better. He is of opinion that the true ætiology of the condition is not realised. In his opinion it is due to paresis of both external recti. This theory is a simple one to understand by those who believe it, but a difficult one to make unbelievers understand. Another problem is the absence of diplopia in concomitant convergent strabismus. Prof. Snellen pointed out that each eye is a complete visual entity. The eyes may be used separately for two different purposes—e.g., one eye may be looking down a microscope, and the individual's attention is concentrated on the work of that eye, but at the same time he can receive impressions of a totally different nature from the other eye, such as sudden movements in the room where he is. In strabismus the patient must fix with one or other eye, and it is obvious that he will use the better of the two; he may use one for distance and one for close work. If both eyes are equal he may use the right eye when looking to the left and the left eye when looking to the right, thus producing "alternating squint." In paralytic squint the patient attempts to use both eyes at once, and consequently he sees double.

Mr. A. F. MacCallam spoke of his

Twenty Years' Ophthalmic Work in Egypt.

He described the condition in Egypt in 1903, when he first went out, the difficulties which had to be overcome before an efficient ophthalmic service could be instituted, and how both officials and population were suspicious of the efforts which were made. The service has now got 14 hospitals as well as numerous travelling hospitals. They are staffed by Egyptians and are maintained partly by Government grants and partly by the local county councils.

Mr. Leslie Paton reported some

Ocular Complications of Spontaneous Subarachnoid Hæmorrhage.

He based his remarks upon two clinical cases and upon a review of the literature. The anterior portion of the circle of Willis is by far the most common site of hæmorrhage owing to the lack of surrounding tissue support, the poorly developed adventitia of the vessel, and the great frequency of congenital abnormality in them. Local syphilis and tubercle are not common causes; the most common causes are aneurysm, which may develop from a congenital abnormality, infective emboli, and high blood pressure. An unruptured aneurysm rarely causes eye symptoms, although certain cases of ophthalmoplegic migraine have been attributed to this. Papillœdema may follow rupture of an aneurysm immediately if there is any blocking of the optic foramen, in a few days if the intracranial pressure increases slowly, and it may not appear for some months if a cystic hæmatoma is formed. Hæmorrhage appearing in the fundi is due to leakage along the nerve sheath and through the lamina cribrosa.

Dr. Brownlow Riddell read a paper upon

Eye Symptoms in the Early Diagnosis of Disseminated Sclerosis.

He based his remarks upon a series of cases which had come under his observation since 1897. He had been very much impressed by the frequency in which a retrobulbar neuritis or a transient attack of diplopia preceded any other gross evidence of organic change. In a number of such cases—i.e., retrobulbar neuritis or transient diplopia—careful physical examination revealed unsuspected evidence of the disease, and in recent years serological examination has helped to confirm the diagnosis. He urged that all such cases at an eye clinic should be looked upon with suspicion, although he was well aware that the immediate ophthalmological prognosis was good. A lively discussion followed this paper, during which Dr. de Schweinitz expressed the opinion that even after the accessory sinuses had been operated upon in cases of retrobulbar neuritis in which they were believed to be the cause, disseminated sclerosis could not be eliminated, and he entirely agreed with the essayist upon the points which he emphasised. Mr. T. Harrison Butler pointed out the difficulty in the differential diagnosis of disseminated sclerosis and of certain mild cases of encephalitis lethargica. Messrs Leslie Paton, Basil Graves, Gray Clegg, A. J. Ballantyne, Johnson Taylor, H. L. G. Leask, and Bernard Cridland also spoke.

FRIDAY, MAY 2ND.

On May 2nd the general business meeting was held and the report of the Council of British Ophthalmologists was received. Mr. E. Treacher Collins was elected President for the session 1924–25. In the afternoon a reception was held at the University by Sir Donald and Lady MacAlister.

Clinical Meeting.

In the forenoon a successful clinical meeting was held at the Glasgow Eye Infirmary. Cases of great interest and diversity were demonstrated by the local members of the Society; and Mr. Harrison Butler, with the assistance of Mr. Basil Graves, Dr. W. C. Souter, and Mr. A. H. H. Sinclair, helped to initiate some of the members in the use of the Gullstrand slit lamp and corneal microscope. Mr. Butler gave also a demonstration of the use of Hess's apparatus for the investigation of muscle paresis. This gave rise to some interesting discussion, but as most of those present were unfamiliar with its use, its value could not be finally assessed. It seemed, however, to be a method which is admirably adapted for use in very young or very unintelligent patients, but a little elaborate for routine dispensary work.

Dr. J. Rowan demonstrated some of the cases of congenital cataract upon which he had operated in the manner described in his paper, which he read to the Society later. Dr. Wright Thomson showed some cases of glaucoma upon which he had performed Bentzen's modification of Elliot's operation, where an inferior incision is made close to the corneo-scleral margin and the conjunctiva allowed to retract slightly. This permits of clearer access for the trephine and reduces the danger of "button holing." Dr. Ballantyne showed two cases of birth injury to the cornea, one of unilateral congenital anophthalmos and a most interesting case of a rare form of muscular dystrophy. This case showed involvement of the extra-ocular muscles and the muscles of the face on both sides. Dr. Riddell and Dr. Hislop Manson demonstrated three members of a family of "blue sclerotics." Fourteen members of the family have been traced and the condition is present in varying degrees in nine of them. The family includes two girls, twins, one with and the other without the condition. The affected members have had more than a fair share of fractures, but there is no history of deafness nor of hæmophilia. Dr. Riddell showed a case of choroideremia with a family history of retinitis pigmentosa. Mr. Inglis Pollock had numerous cases showing the results of operation on glaucoma by the Lagrange method and of simple extraction followed by early division.

The Gullstrand Slit Lamp and Corneal Microscope.

This demonstration was of the greatest interest, and a practical demonstration of the instruments is almost essential before one can grasp the rudiments

of the subject or realise the fields of research which their use open up. As an illustration, the arrangement of the instruments can be compared to two knives plunged into the centre of an apple at different angles but on the same horizontal plane. One knife represents the slit lamp beam, the other the axis of the corneal microscope through which the observer looks, and the apple represents the eye. Only that portion of the eye traversed by the beam is illuminated directly, and obviously that is the only portion which is seen when the observer looks through the corneal microscope. There are numerous adjustments which can be carried out, the size and shape of the slit lamp beam can be altered, and the angle of approach both of the microscope and the lamp can be varied to suit the object of the observer. It is clear that numerous corrections must be made for the different refractive indices of the strata through which the beam passes and for other sources of error, such as reflection of the beam from the various reflecting surfaces which it strikes, and for an impression of intensification of the beam where light is thrown back towards the observer as it passes into a tissue which has a different refractive index. These factors have all to be taken into account when translating what one thinks one sees into what is actually present. Mr. Butler, by means of a few simple diagrams, made it easy for inexpert members of the Congress to understand what they saw in the normal eye. He also demonstrated the slit lamp features of certain pathological conditions, such as iritis, cataract, corneal opacities, &c. The solution of many problems may be hastened by its use—for example, that of developmental errors. One of its great practical uses is that sympathetic ophthalmia may be detected at a very much earlier stage than formerly—before, in fact, the clinical picture of the disease has had time to develop.

At the evening session held at the University, Mr. Butler followed up his work of the morning with a paper on the

Anatomy of the Normal Lens as Revealed by the Slit Lamp.

He explained his own difficulties in approaching the subject. Most of the literature was in German, a great deal of it was diffuse and obscure, and there was at present no text-book on the subject. Another problem to be faced was that, having read the literature, he found the application of it extremely difficult, as each observer had his own ideas about the interpretation of what he saw and his own standards in the differentiation of light, shade, and colours. The preparation of illustrations was made difficult owing to circumstances which forced them to be only memory pictures. The final problem was that, having mastered the technique and the literature, it was found that no two lenses appeared alike, and consequently the difficulty of explaining what a normal lens should look like was very greatly increased. This could only be solved by each observer examining clinically normal eyes and forming his own opinion as to what was and what was not early pathological change. For example, in the morning he had demonstrated pigment granules to be present on the anterior lens capsule of the eye of one of the members of the Congress. This was of no significance. Small areas of what appeared to be cataractous change were seen so frequently in individuals of all ages who were perfectly well that they were of no significance, so far as our present knowledge went.

Mr. Butler exhibited an instructive series of drawings prepared by himself showing the normal lens in many of its normal variations; he also demonstrated certain fallacies which have to be avoided. The anterior Y and posterior inverted Y could usually be seen; as was well known, these were the results of the suturing of the lens. Numerous other sutures could also be appreciated in healthy people; the lens nuclei could be shown and the various layers which went to make up the lens appeared with a variety of colour and shade quite unsuspected before the introduction of this aid to clinical investigation. A small opacity of no pathological significance in the anterior portion of the lens might throw an intense shadow across the field of vision and might lead the observer into the error of supposing that it was due to a more important change. The literature was already showing signs of inaccurate nomenclature, and he suggested some simpler terms which could be used to replace those resulting from literal translation from the German.

Later in the evening Mr. Basil Graves gave a paper on the

Histological and Slit Lamp Features of a Limbus Tumour.

Owing to the short time at his disposal his demonstration had to be hurried. He explained certain difficulties, particularly of an optical nature, which he had found in the use of the slit lamp, and demonstrated their solution by means of simple diagrams. He also drew attention to the occurrence of a copper bronze reflection from normal epithelium on the posterior corneal surface when the angle of incidence of the slit lamp beam and of the axis of the observer's eye were exactly the same. The object of his paper was to correlate the ordinary clinical, histological, and pathological features with the slit lamp findings in the case of a boy who had a small limbus tumour. Examination by the slit lamp demonstrated its pigmented character and also a thickening of the connective tissue immediately behind it. It was removed and found histologically to be a tumour somewhat similar to a skin mole or innocent melanoma.

Mr. J. Gray Clegg read a paper on

Central Scotoma in Anterior Uveitis.

Several cases of this nature had come under his observation, and he was of opinion that the association would be found, if looked for, in a proportion of cases of anterior uveitis. In most of his cases the condition cleared up with the subsidence of the primary disease. He expressed the opinion that the condition was analogous to the toxic scotomata caused by alcohol, tobacco, T.N.T., &c., except that in the cases he was reporting the toxic effect was produced by direct spread through the vitreous humour. He described a few of his cases in detail, and urged members of the Society to investigate cases of iridocyclitis for the presence of scotoma.

Dr. Ivy McKenzie spoke on the

Trigeminal Nerve as an Integrating Mechanism between the Nose and Eyes.

He remarked on the complexity of the fifth nerve and its connexions, and expressed the opinion that it was one of the most complicated nerves in the body. His remarks turned on his belief in the theory that sensory nerves can carry stimuli from the central nervous system to the periphery. He regarded the existence of antidromic impulses as proved beyond doubt. He applied this theory to the explanation of certain forms of headache; the fifth nerve nucleus was irritated by some poison or toxin and the impulses carried out from it were referred to the head and so produced headache. On similar lines he suggested an explanation of the frequent clinical association of giddiness, vertigo, vomiting, and headache, in the close association in the brain of the nuclei and centres connected with these symptoms. He suggested that a parallel state of affairs existed with regard to the ulnar nerve; symptoms might be referred to the area supplied by it in conditions such as pleurisy, angina pectoris, and gall-stones. This was owing to the fact that stimuli from the diseased region were referred to the central nervous system and arrived, in the diseases chosen for illustration, about the position where the sympathetic endings in the cord could irritate the nuclei from which the ulnar nerve fibres arose. Further, the fifth nerve nucleus was connected up within itself by a network of "fibræ comitantes," which could be used, along with the antidromic theory, to explain numerous conditions such as the stimuli from a diseased tooth being referred to a sound one or

to the supra-orbital region. These he described as examples of "irradiation of stimuli." He suggested the application of these theories to eye conditions, particularly trophic and nutritional disturbances, such as herpes and certain forms of ocular pain.

Sir John Parsons did not agree with the statement that the antidromic theory was generally accepted. He had an idea (which he found a little difficult to express clearly) that the "epicritic" distribution of headache was untrue. To his mind certain headaches were much more like a "protopathic" explosion, a primitive nerve action, and the distribution could not be mapped out according to the branches of the fifth nerve.

Mr. Leslie Paton referred to Head's brilliant researches, and also doubted the antidromic theory. He thought that many of the illustrations used to back it up could be explained by the presence of a virus possessing neurotropic and dermotropic characters, and quoted experimental work on rabbits in which herpes had been produced by the dermotropic action of a virus. By transferring the infection through a series of rabbits the neurotropic elements became exalted and symptoms of encephalitis lethargica were produced. In his opinion, all antidromic phenomena could be explained by assuming that the neurotropic and dermotropic powers of the virus manifested themselves at the same time.

Miss Ida C. Mann read a paper on

Coloboma Iridis and its Embryology.

She mentioned several theories which had been put forward as explanations, but for simplicity did not go into the details of their rejection. Any theory which was to explain the condition must be capable of application to all the positions in which coloboma iridis occurs; to the fact that the fissure was sometimes incomplete; to partial colobomata which appeared like holes in the iris; and also to aniridia, a condition the existence of which the speaker appeared to doubt. In a beautiful series of drawings she illustrated what she believed to be the true developmental reasons. Certain branches of the hyaloid artery which break up to form the vascular capsule of the lens pass out of the extreme pupillary end of the cleft to anastomose with vessels outside the developing optic cup. These anastomosing vessels were most marked at the sites where coloboma iridis was most common—i.e., downwards and on the inner and outer sides. If any one of these vessels and its surrounding tissue persisted in a well-developed state, the advancing border of the optic cup, which in course of time would form the retinal iris, was arrested and the unobstructed portion on each side swept forward, thus forming a cleft in what would otherwise be a normal iris. Pathological evidence of the truth of this theory was found on examination of the developing eye of an anencephalic embryo.

Prof. T. H. Bryce said that he was extremely interested in the paper and thought that the explanation put forward was very reasonable. Mr. E. Treacher Collins also spoke.

SATURDAY, MAY 3RD.

On the morning of May 3rd the final meeting of the Congress was held at the University. Dr. John Marshall gave an account of a case of

Persistent Hyaloid Artery and Tunica Vasculosa, with Buphthalmos.

The patient was a child of 3 who had been seen when about a year old; the condition was diagnosed as pseudo-glioma. When seen later she was suffering from buphthalmos with iris bombé and intercalary staphyloma. The eye was removed on account of its size (by Dr. Riddell). He described the pathological findings and asked for information as to the possibility of operative treatment along the lines of a trephining operation in the early stage, thus preventing stretching of the globe. Mr. E. Treacher Collins and Sir John Parsons gave their views on the condition.

Dr. John Rowan reported the results of

Iridectomy in Congenital Cataract.

Among the points which he advanced were: (1) The patient did not require to wear glasses; (2) the condition, as a general rule, was not progressive; and (3) it was to be preferred to more radical methods of cure. He performed his iridectomy downwards and made it as small as possible. On the previous day he had been able to demonstrate cases which had been operated upon over 20 years ago. He gave a short account of some of his more recent cases as evidence in support of this method of treatment. An interesting discussion followed, in which Dr. A. J. Ballantyne, Dr. W. G. Sym, Sir Arnold Lawson, Mr. J. F. Cunningham, Mr. Johnson Taylor, Mr. Gray Clegg, Mr. Herbert Fisher, Sir John Parsons, Mr. Treacher Collins, and Dr. James A. Wilson took part.

Dr. G. F. Alexander read two communications: one describing an operation in failure of iridectomy for glaucoma, and the other on the advantages of a strong solution of atropine in removal of cataract. The points raised by the speaker were essentially concerned with technique.

Dr. S. Spence Meighan reported two cases of

Traumatic Vesicular Keratitis.

He said that this was a rare condition. De Schweinitz had seen three cases in 12,000 patients. He pointed out its extreme resistance to all forms of treatment and the difficulty of diagnosis in the first instance. One of his cases was present at the clinical meeting on the previous day. There was a good deal of discussion following his remarks, in which, amongst others, the following spoke: Dr. Ballantyne, Mr. Johnson Taylor, Dr. Wilson, Sir Arnold Lawson, and Mr. Paton. The last named made the most interesting suggestion that the resistance to treatment and anæsthesia of the cornea present in this condition might be due to failure on the part of the minute nerve endings in the cornea to regenerate, thus producing in the cornea a condition analogous to "stump neuromas."

Mr. Inglis Pollock urged the advantage of early division after simple extraction operations. This second operation he carried out, if all went well, on the fifteenth day after the primary one. He advocated the use of a Ziegler knife in preference to a needle.

Conclusion of the Meeting.

The President, at the conclusion of the meeting, expressed the pleasure and honour that it had been to him to welcome the Society to the place where MacKenzie had lived and worked. His name would always be a source of inspiration to ophthalmologists. Mr. Herbert Fisher expressed for the visiting members of the Society their gratitude and appreciation of all that had been done to make the Congress the great success it had been. He desired the meeting to instruct the Secretary to express their special gratitude to the Principal of the University, Prof. Graham Kerr, and the other members of the staff who had done so much for them by placing the Department of Zoology at their disposal.

SCIENTIFIC MUSEUM.

In connexion with the Congress a museum was arranged, and the following were among the most interesting exhibits. Dr. A. Maitland Ramsay and Dr. Alex. Garrow showed a beautiful series of autochrome plates of diseases of the eye. Dr. Leslie Buchanan showed original papers of great historical interest, such as a first edition of Helmholtz's paper on the ophthalmoscope, some of MacKenzie's instruments, and his paper on the treatment of strabismus. Dr. Ballantyne displayed a series of fundus drawings executed by himself. Prof. Bryce showed specimens illustrative of the development and anatomy of the eye, from the Department of Anatomy. Prof. Graham Kerr showed microscopic preparations illustrative of the comparative anatomy of the eye, from the Department of Zoology, and a demonstration of the use of the binocular eye-piece with high power microscopic objectives.

Exhibits of Value in the Teaching of Ophthalmology.

The scientific museum in connexion with the Congress gave evidence of the admirable teaching facilities offered by the various departments represented. Among notable exhibits were Cleland's famous series of dissections of the eye in various classes of vertebrates, which make one wonder whether we are not losing the art of dissection. Which of us would feel quite confident if asked to display intact the membrane of Descemet with scalpel and forceps?

Another interesting section showed a series of models (illustrating phases of development in vertebrates), which had been made by the students in the class of embryology themselves. With this exhibit was associated a series of most perfect sections of the embryonic eye in lepidosiren.

The most striking exhibit, perhaps, from the teaching point of view, was a large series of autochrome plates of external diseases of the eye. These were shown by Dr. Maitland Ramsay, Dr. John Rowan, and Dr. Alex. Garrow. Dr. Rowan's series were stereoscopic and of extreme value to the student of eye diseases, as one almost seemed to be looking at the actual patient. The colouring was perfect. In most cases the picture showed the head and shoulders of the patient, so that an excellent idea of the general type of person could be formed, obviously of much more value than a picture of an isolated eye, however well drawn or photographed. The plates illustrating interstitial keratitis, marginal blepharitis, rodent ulcer of the lids, and ophthalmia neonatorum were specially valuable in this respect. Everyone knows that systematic teaching in the out-patient department is sometimes marred by the failure of a sufficiently great variety of cases, and a series of such plates, particularly stereoscopic, would be a most useful adjunct, allowing of comparison of a whole series of similar conditions with the patient of the moment.

At this exhibition one was reminded strongly of the dictum that while the older universities supply tradition and the stimulus to research, it is to the northern universities that one must go to see teaching institutions par excellence. In the south the undergraduate may sometimes be looked on as a necessary encumbrance; in the north he is the central figure in the university and his every requirement is catered for.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The Medical Officer and the Medical Inspector.

VERY many private enterprises and business houses make themselves responsible for the medical care of their employees, victims of industrial accidents or diseases, while those suffering from injuries received in the war obtain medical assistance under legal regulations. It is now suggested by the legislature to subject a third of the French population to compulsory insurance against sickness, and to give to the medical man in charge of industrial personnel the double rôle of doctor and medical inspector or controller. Dr. Balthazard, Professor of Legal Medicine in the Paris Faculty, has therefore drawn the attention of the Academy of Medicine to this proposal as one which violates the principles of the profession, for the doctor in charge in such circumstances of sick employees, if he were also the inspector for the employers, would be obliged to inform his principals of the diagnosis, cause, and probable duration of the illness. It is obvious that the provision of medical attention for the workers may provoke misunderstanding between the employers and the workmen, but the doctor who actually treats the men is the only person qualified to look after the interests of the sick, and it is impossible that a doctor paid by the employers can also be constituted arbiter between them and the sick men under his care. Certain business concerns, whether private or public, like gas companies, police bureaux, or the Assistance Publique, realise the necessity for the distinction which the law has lost sight of, arranging that while the sick man is looked after by the doctor of his choice, control is exercised by another medical man nominated by the employers. While medical inspection is to be organised alike for the victims of industrial accidents and those who are drawing legal pensions, it is established by law that neither the doctor in charge nor the doctor nominated by the employers can be selected as an expert in legal proceedings consequent on industrial injury. On the motion of Prof. Balthazard the following resolution was passed by the Academy: "In the interests of the sick who ought to find in their own doctors their natural protection, and mindful also of the principles guarding medical confidence, the Academy affirms that in every organisation for medical treatment the rôle of the doctor actually treating must be considered incompatible with that of controller or inspector. In matters of expert treatment the Academy affirms that the incompatibility is yet more strict between the duties of the expert and those of either the doctor in charge or of the inspector."

The Children of Tuberculous Mothers.

It seems well established to-day that tuberculous infection of the fœtus, produced through the placenta, is of infinitely rare occurrence, and that the infection of nurslings born of tuberculous mothers is a result of familial contagion. But it is under discussion whether these children are born with a diminished coefficient of vitality, as in France Landouzy and Barbier have maintained. In contravention of this view Debré thought it possible to establish that these children are born with a weight of about 3250 g.—i.e., a weight little, if any, below the average. Quite recently Prof. Couvelaire, who has made a study of children born from tuberculous mothers, brought up by foster-parents and withdrawn from contact with their mothers, has revealed to the Society of Obstetrics and Gynæcology at Paris the very high mortality among them—viz., 38 per cent. in the first month. Most of the infants died from no demonstrable cause—one might say that they went out like lamps unsupplied with oil.

Dr. Vignes laid down at one of the last sittings of the Society of Biology that, save for a few exceptions, if one sets down the weight of the children born of tuberculous mothers at the exact term of gestation and compares this weight with the average weight observed at the same period among the newly-born in Paris, we find some instances of weights superior to the average or approaching that average, and a very great number of children who are inferior in weight, that inferiority being more accentuated among children of multiparæ than among those of primiparæ. The results of this work are in contradiction to those of another communication by the same author to the French Association for the Study of Cancer (Séance, March, 1924), for children born of cancerous mothers, even if the cancer was grave, had generally a weight fairly approaching the average.

Syphilis of the Œsophagus.

Even before the invention of radioscopy syphilis of the œsophagus was considered very rare, and now Dr. Guisez, of Paris, has reported to the Academy of Medicine on a series of more than 3000 œsophagoscopies, saying that he has only observed among them one well-established case and one doubtful case of syphilis. The œsophagus is one of the organs that is most rarely attacked by syphilitic lesions, and it would be well to take notice of this fact and to drop the perpetual inclusion of syphilis in the differential diagnosis of the causes of severe stenosis of this tube, leading to the institution and prolongation of treatment which may have ill consequences for the patients. It would seem that the majority of the cases published under the name of syphilis of the œsophagus were simple inflammatory stenosis, an affection which is recognised under œsophagoscopy to be more frequent than has previously been suspected.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following table gives some of the principal statistics of the County Borough of Reading and the Urban District of Finchley for the year 1923:—

Name of borough.	Estimated mid-year population (R.-G.).	Birth-rate.	Death-rates per 1000 of the population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Respiratory with influenza.	Neonatal mortality.	Infant mortality.	Maternal mort. from childbirth.
Reading (C.B.)	93,160	18·3	11·1	1·2	1·2	1·6	29	52	6·4
Finchley (U.D.)	47,020	15·6	9·0	0·7	1·5	1·2	23	38	5·4

Reading.

Dr. H. J. Milligan indicates some of the changes in the age distribution of the population revealed by the census—viz., a deficiency in the numbers of children below 10 years and of males at the mid-period of life resulting from the war; and an increasing proportion of persons of advanced years, indicating an increased expectation of life, the result of improving sanitary conditions. Housing conditions, however, do not improve. Of 131 houses erected during 1923, 20 were part of a municipal scheme. The shortage of cottages continues, and many existing "unfit" houses would be closed were there alternative accommodation. The number of applicants for houses is as high as it was two years ago. The death-rate from pulmonary tuberculosis, which fell to 0·89 in 1919, has tended to remain stationary and last year showed an increase to 0·99. Extensive use is made of the 33 shelters provided by the council for open-air treatment and 26 of these were in regular use in the month of December, some in the day-time only. The number of new Reading cases of syphilis and gonorrhœa treated at the clinic during 1923 were 32 and 46 respectively, as compared with 153 and 168 in 1919, the year of maximum incidence. Dellwood Maternity Home continues its eminently successful work. During the year 285 patients were admitted. Of these, 91 came from a one-roomed home, 97 from a two-roomed, and 97 from homes of more than two rooms. Of the latter group 37 were admitted as the patients of general practitioners. Thirty-seven of the patients were admitted free of charge and the remainder paid on the average £1 6*s.* 6*d.* per week. The Home takes trained nurses as pupil-midwives and nine pupils have passed the C.M.B. examination since the training scheme was begun. A considerable proportion of the milk now sold in the borough is "Grade A (Tuberculin-tested)." Dr. Milligan also reports that, although much of the milk sold is subjected to a process of heating, no licences have been issued for the sale of "pasteurised" milk.

The school report includes a comparison of the physique of Reading and American children, much to the advantage of the latter. The methods used and the social status of the children are said to be comparable. Dr. Agnes Bernfeld reports successful results from the treatment of chronic otorrhœa by zinc ionisation. The method has been in force for over three months and 28 cases have been treated. Of these, 20 cases have been apparently cured and the remainder improved. Miss Marion S. Mackinnon succeeded Mr. W. Adderley as school dentist in May, but the increasing number of those who accepted treatment made it impossible to inspect all the schools during the year. It is suggested that the children of parents who consistently refuse treatment should be entirely disregarded and effort concentrated on the 6 to 8 year old groups and the following up of children who regularly avail themselves of treatment. Miss Mackinnon also hopes to enlist the help of the older children and encourage them to interest themselves in the oral hygiene of their younger brothers and sisters.

Finchley.

Dr. Wilson Jameson reports that the joint ownership of the Hornsey Hospital by Hornsey, Wood Green, and Finchley has proved very satisfactory. The question of providing cubicle isolation wards is now under consideration. A motor ambulance for the conveyance of persons injured by street accidents and suffering from non-infectious complaints was purchased in August for £376. From August 10th, 1923, to March 6th, 1924, the ambulance was called out 177 times. The payments received were £95 and the running costs were £56. Both the public and the general practitioners have welcomed the arrangement. The details of the census returns appear to show that Finchley since the war is no worse off as regards housing than it was before the war. This is probably accounted for by the fact that the number of the average family has declined from 4·33 to 3·93. There is, however, more herding of families in houses only intended for one family. Subletting was found in 35·7 per cent. of 646 typical working-class houses; and in the 200 houses erected under the council's assisted housing scheme subletting was discovered in 30 per cent. In Finchley three firms now produce "designated" milk. One firm produces "certified" milk and "Grade A (Tuberculin-tested)" milk; another produces "Grade A" milk; and the third "pasteurised" milk. In January, 1924, milk with no official guarantee was sold in Finchley at 8*d.* per quart, whereas "pasteurised" milk cost 8*d.*, "Grade A" milk 10*d.*, "Grade A (Tuberculin-tested)" 1*s.*, and "certified" milk 1*s.* 2*d.* per quart. The provision of a refuse destructor is still under consideration. In the meantime the old method of burning refuse in heaps at the sewage farm still continues.

In his report as school medical officer Dr. Jameson refers to the great benefits likely to result from the decision of the Education Committee to appoint an organiser of physical training. One of the head teachers who had special qualifications for the post, Mr. G. R. Mellor, was appointed and took up his new duties in November. A good beginning has been made by a survey of the possibilities of the scheme, first, by a questionnaire addressed to all the head teachers, and secondly, by observing all the teachers responsible for physical training at work. This was followed by two introductory lectures—viz., "The School as a Centre of Preventive Medicine," designed to illustrate the comprehensiveness of the term "Physical Education," and its great value both to education and preventive medicine, and a second lecture, largely a résumé of the 1919 syllabus of physical training. The syllabus is now being taken in greater detail at weekly meetings of the teachers. The organiser is, of course, extending his interest to swimming, organised games, and all forms of physical recreation. Altogether the new departure is being taken up with enthusiasm and bids fair to be a great success. The school medical officer conducts the medical inspection of the two secondary schools on behalf of the Middlesex County Council, and has the satisfaction of recording that, mainly owing to the interest shown by the headmasters, all the cases referred for treatment in 1922, with the exception of three, obtained treatment before the end of 1923, and this in spite of the fact that there is no arrangement in force for the provision of treatment in the case of the secondary schools. The school dentist, Mr. G. H. W. Randell, reports that 80 per cent. of the children "referred" presented themselves at the clinic for treatment. He deplores the idea that the average adult still regards dentistry as a form of torture. Probably in these days of painless dentistry and the widespread recognition of the enormous benefits of early treatment, this "idea" is rather

the perpetuation of an obsolete joke, which had its origin when dentistry was not what it is now. As Mr. Randell points out, the dread of dental treatment will, in course of time, disappear, and the much appreciated cooperation of the head teachers is a most valuable means to this end.

INFECTIOUS DISEASES IN ENGLAND AND WALES DURING THE WEEK ENDED APRIL 26TH, 1924.

Notifications.—The following cases of infectious disease were notified during the week—namely: Small-pox, 124; scarlet fever, 1328; diphtheria, 615; enteric fever, 53; pneumonia, 1674; puerperal fever, 51; cerebro-spinal fever, 10; acute poliomyelitis, 5; acute polioencephalitis, 1; encephalitis lethargica, 212; dysentery, 3; ophthalmia neonatorum, 117. No cases of cholera, plague, or typhus fever were notified. The cases of encephalitis lethargica, 41 fewer than in the previous week, were notified in the following counties: London, 31; Chester, 6; Derby, 9; Devon, 4; Durham, 4; Essex, 8; Gloucester, 13; Kent, 4; Lancaster, 27; Lincoln, 5; Middlesex, 4; Northumberland, 7; Nottingham, 4; Warwick, 27; Yorks W.R., 37; and elsewhere in smaller number.

Deaths.—In the aggregate of great towns, the deaths from influenza fell from 282 to 218. In London the deaths from diphtheria numbered 12, from measles 57 (same as last week), from influenza 21 (a drop of one-half).

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdrs. J. G. Peebles and L. S. Whitwam are placed on the retd. list.

J. V. Williams to be Surg. Lt.

The following appts. have been notified: Surg. Comdrs. A. F. O. Sankey to R.N. Hospital, Portland; E. L. Markham to the *Castor*; H. E. Perkins to the R.N. Hospital, Bermuda; and A. G. V. French to the *Canterbury*, temp. on commissioning.

ARMY MEDICAL SERVICE.

Col. H. P. W. Barrow, late R.A.M.C., to be Dir. of Hygiene, vice Maj.-Gen. W. W. O. Beveridge.

The undermentioned Maj.-Gens. retire on retd. pay: W. W. O. Beveridge, K.H.P., late R.A.M.C.; and E. M. Pilcher, K.H.S., late R.A.M.C.

Lt.-Col. F. Ashe, from R.A.M.C., to be Col.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. and Bt. Col. J. W. West, K.H.S., is granted the temp. rank of Col. whilst empld. as Consulting Surg. to the British Army, vice Maj.-Gen. E. M. Pilcher.

Capt. L. J. Sheil retires, receiving a gratuity.

TERRITORIAL ARMY.

Supernumerary for Service with O.T.C.—Capts. (Local Majs.) P. H. Mitchiner and G. A. Williamson to be Majs.

A. MacPherson to be Lt.

ROYAL AIR FORCE.

Flying Officer K. R. Smith relinquishes his temp. commission on ceasing to be employed.

INDIAN MEDICAL SERVICE.

Maj.-Gen. A. Hooton has been confirmed in the appointment of Surgeon-General with the Bombay Government in succession to Maj.-Gen. W. J. Jennings, K.H.S., on leave, pending retirement. Lt.-Col. W. O'S. Murphy has returned from leave and assumed the appointment of Director of Public Health with the Bombay Government. Lt.-Col. A. W. Tuke, civil surgeon, Ahmedabad, has proceeded on leave.

DOVER: NEW DENTAL CLINIC.—The adult dental clinic presented to Dover by Major J. J. Astor, M.P., will be opened to-day (Friday). Major Astor has undertaken to meet the expenses of the clinic for the first two years, and the staffing and other arrangements have been approved by the town council. The clinic adjoins the municipal buildings.

Correspondence.

"Audi alteram partem."

SIR MALCOLM MORRIS MEMORIAL FUND.

To the Editor of THE LANCET.

SIR,—The death of Sir Malcolm Morris, on Feb. 19th last, marks the passing of one who was widely known and greatly respected, both by his professional colleagues and the public generally, for his work in connexion with dermatology, tuberculosis, public health, and medical literature.

To perpetuate his memory it was resolved at a recent meeting of representatives of the various hospitals and organisations with which he was particularly associated, to endeavour to raise a sum of money sufficient to provide for an annual lecture on the preventive aspects of public health and dermatology. If funds permit it is hoped also to endow a bed for cases of skin disease at St. Mary's Hospital, London. These objects are known to accord with Sir Malcolm Morris's expressed view that the only fitting memorial to a life of successful endeavour is one that carries on the causes to which that life was devoted.

A representative committee has been formed, and we invite contributions, in any amounts, which will be gratefully acknowledged if forwarded to the hon. treasurers, Malcolm Morris Memorial Fund, at 12, Stratford-place, London, W. 1.

We are, Sir, yours faithfully,

THOMAS HORDER,
Federation of Medical and Allied Services.

E. B. TURNER,
British Medical Association.

E. GRAHAM LITTLE,
St. Mary's Hospital.

C. NEVILLE ROLFE,
Nat. Council for Combating Ven. Diseases.

W. GRIFFITH,
St. John's Hospital.

A. E. HAYWARD PINCH,
Radium Institute.

H. T. HERRING,
Cremation Society of England.

N. HOWARD MUMMERY,
Hon. Secretary.

May 1st, 1924.

A CRITICAL EXAMINATION OF PSYCHO-ANALYSIS.

To the Editor of THE LANCET.

SIR,—In THE LANCET of April 26th Dr. Wohlgemuth suggests that he has been successful in showing that psycho-analysis and its means of penetrating the unconscious is unscientific and fallacious, and that, in common with other psycho-analysts, I am avoiding the main thesis in side-tracking the discussion upon unessential details. As Dr. Wohlgemuth seems to be incapable of understanding the psycho-analytic conception of the unconscious it is difficult to know what kind of proof he requires. He has not employed the technique himself, but presumably knows that associations made by the patient are recorded in plenty and that their reactions have been described. These communications are the proof of the need for the theory. Dr. Wohlgemuth is in the position of a critic of chemical theory who refuses to handle a test-tube. I referred him to one book in which the "test-tube" results are recorded independently of theory. The point of discussion concerning abreaction is one which he raised himself; his denial of results which are confirmed by responsible English physicians is surely evidence of a desire to reject proofs when they are offered. What does he require?

I am, Sir, yours faithfully,

ROBERT M. RIGGALL.

Wimpole-street, W., May 3rd, 1924.

THE NARCOTIC ACTION OF PURE ETHER.

To the Editor of THE LANCET.

SIR,—On March 7th I had the honour of addressing the Section of Anæsthetics of the Royal Society of Medicine on the subject of the Narcotic Action of Purest Ether. A short report of this lecture appeared in THE LANCET of March 15th, 1924 (p. 561), and a full account will be published in the Proceedings of the Society.

The starting-point of our research on the narcotic action of variousethers was the statement of Mackenzie Wallis, that purest ether had no narcotic action at all, but was only rendered narcotic by the action of impurities. Of these impurities ethylene and certain ketones of the middle of the series were said to be the most important ones, and consequently a commercial product, "Ethanesal," was put on the market, which was later stated by Wallis to contain 5 per cent. of methylethylketone. Mackenzie Wallis and some others stated that this preparation had a narcotic action superior to that of ether.

In my lecture mentioned above I made the statement—which fully confirmed the former work of Dale, Hadfield, and King—that the purest ether obtainable has the same narcotic action as the ordinary ethers used, whilst also the action of "Ethanesal" did not in any way differ from the action of purest ether. I also mentioned that, as a rule, addition of various impurities to ether did not materially change the *narcotic* action of ether, but that methylethylketone made an exception, in that addition of 5 per cent. of this substance changed the action of ether. On narcotising cats with this mixture I had found that less was necessary to keep the animals in a certain depth of narcosis during an hour than in the case of pure ether. This finding seemed interesting in view of the fact that "Ethanesal" was claimed to contain methylethylketone in this proportion. It was then necessary, however, to investigate the action of mixtures of ether with 5 per cent. of methylethylketone further, paying special attention to eventual toxic actions. After returning from England these investigations were started, but reached an unexpectedly quick conclusion, since we observed that this mixture is extremely toxic. Cats narcotised with it on two consecutive days (or with one day's interruption) usually die. On making a necropsy we found hæmorrhages in lungs, liver, and kidneys, and blood and bilirubin in the urine.

I have felt obliged to make early mention of this result in this way, since in my lecture I had mentioned the *possibility* that addition of methylethylketone to ether might prove to be useful, and I feared that this statement, together with Wallis's claim that "Ethanesal" contains 5 per cent. of methylethylketone, might induce someone to try a mixture of pure ether and 5 per cent. of methylethylketone on men, which would be little short of disastrous.

As far as I can see, the position with regard to "Ethanesal" is as follows: Mackenzie Wallis claimed on successive occasions that "Ethanesal" contains "ketones comprising those in the middle of the series" (THE LANCET, June 4th, 1921, p. 1175) 2 per cent. and later 5 per cent. of methylethylketone (THE LANCET, March 3rd, 1923, p. 428). At the meeting on March 7th he stated again that "Ethanesal" should contain methylethylketone, and read the report of a well-known analyst, who had found ketones in "Ethanesal" to the extent of 1·3 per cent. In commercial "Ethanesal" we, like Dale and his colleagues, found no trace of ketones, but *N*. butylalcohol. (If *iso*butylalcohol had been added, methylethylketone might have been formed.) Now we find that if 5 per cent. of methylethylketone is actually added to purest ether, the mixture proves to be extremely toxic for animals, so that its use in therapeutics would be criminal.

I am, Sir, yours faithfully,

STORM VAN LEEUWEN,
Director of the Pharmacotherapeutical Institute
May 1st, 1924. of the University of Leiden, Holland.

TUBERCULOSIS OF THE LARYNX.

To the Editor of THE LANCET.

SIR,—Sir StClair Thomson's surmise, mentioned in your leading article last week, that "though it would be difficult to make a comparison of the nose and pharynx in sanatorium patients with an equal number of the healthy public . . . trouble in these regions is no more common in a sanatorium than out of it" is, of course, interesting. But what may well be coupled with this is the fact that of the dozen or so of those, from many countries, who *have* made the comparison in question—among them an eminent laryngologist like Moure of Bordeaux—all without exception record great preponderance of such nasal defect in the tuberculous. Sir StClair Thomson's finding that these lesions are not found more frequently in consumptives with laryngeal involvement than in other consumptives tallies with previous experience; and so, I fancy, would his comparison with the normal, were he to make one.—I am, Sir, yours faithfully,

Barnsley, May 3rd, 1924. W. C. RIVERS.

SMALL-POX AND VACCINATION.

To the Editor of THE LANCET.

SIR,—I fear that Dr. J. C. McVail pays the article I wrote in criticism of his address to Members of Parliament a greater compliment than it deserves by devoting five pages to his reply. I am gratified that he should have considered so carefully the various points raised by me, and would thank him for the fair and courteous manner in which he treats me.

Dr. McVail is, of course, a highly skilled and practised controversialist, whose knowledge on this subject is unrivalled. It was not to be expected that any weak, or apparently weak point, however small, in his opponent's case would escape detection. Moreover, he has not confined himself to my article in THE LANCET, but has evidently searched the record of my writings on this subject for the past 22 years pretty closely, and the few slips and inconsistencies that he is able to lay to my charge are not (I hope your readers will agree) very serious.

Many of the points at issue between us I am quite content to leave as they stand in our respective articles for your readers' judgment, but there are some upon which I should like to comment.

1. *Infant Vaccination.*—I am sorry if Dr. McVail thinks that I charged him unjustly with vagueness in the use of the term "vaccination." My complaint, which is against provaccinists as a class and not only against Dr. McVail, is that the term "vaccination" is often used in a different sense when advocating or defending vaccination. If, however, I was unjust in the case in point I regret it.

2. *The Story of Kilmarnock.*—I still think that it is unfair to quote the ravages of small-pox nearly two centuries ago as an argument to justify universal vaccination to-day. For the sake of comparison, suppose a proposition were before Parliament to make anti-typhoid inoculation universally compulsory. Would it be fair to quote the ravages of typhoid fever long ago as an argument for doing so? Surely not!

3. *The Vaccination Acts.*—Dr. McVail says that the question of compulsion or non-compulsion is not for doctors, as doctors, to decide, but for the legislature. Of course, I agree; I have never disputed it; but he goes on to say that "the duty of the medical profession is to inform Parliament and the public of the truth about vaccination, and its safety, and having done so to leave Parliament to deal with the law. . . . If Parliament disbelieves in vaccination it should repeal the Acts. If it believes in vaccination it should exercise some degree of pressure in support of its belief. . . ." (Dr. McVail must forgive me for not quoting the whole passage, but the question of space must be considered.) I should like to suggest that the expression "believes in vaccination," although it sounds so simple, is really

very vague, but I will let it pass. To me the statement recalls the practice of the Ecclesiastical Courts in the old days in trials for heresy. Having found the victim guilty, he was handed over to the "Secular Arm" to be appropriately dealt with. Any odium or responsibility for roasting the heretic then rested on the latter! I suggest that the real moral responsibility for compulsory vaccination rests with the medical profession and not with Parliament, and that it is owing to the manner in which the case for vaccination is presented to them by the medical profession that our legislators believe—sometimes even more strongly than the profession does itself—in the necessity for compulsion.

4. *Individual and Communal Protection.*—Dr. McVail says that the analogy I draw between the old practice of small-pox inoculation and the modern practice of vaccination is a false one because inoculation was infectious whilst vaccination is not. I submit that though vaccination may not be infectious, yet nevertheless it does tend, by masking the disease, to encourage the spread of small-pox, and therefore that the analogy is perfectly valid.

5. *Germany.*—Dr. McVail draws attention to the fact that my views as to the value of the German system of universal vaccination and revaccination have undergone some change. I admit the impeachment. In the light of Germany's unexpected experience with small-pox during the past few years I imagine that others besides myself have had to modify their ideas to some extent about the effectiveness of the German system. We used to think—at least we used to be taught—that owing to universal revaccination in Germany it was possible to dispense with special small-pox hospitals and that ordinary general hospitals could safely be used for such imported cases as might from time to time occur. I am beginning seriously to doubt this. I still believe as firmly as ever that if a whole community (without exception) be vaccinated and revaccinated *often enough*, that community has nothing to fear from small-pox; but I am beginning to doubt if it is really practicable to vaccinate and revaccinate a whole community, without exception, often enough. In any case it is rather a heavy price to pay. In the meantime, until we know a little more about the details of Germany's recent experience, I, personally, shall certainly not feel justified in quoting the German system so confidently as I did in 1911.

6. *Temporary Protection.*—Dr. McVail says that when I state that the immunity enjoyed by small-pox nurses is not evidence that infant vaccination protects the community I am denying "what no human being in his senses ever dreams of asserting." Whilst this may be literally true, nevertheless the argument from the immunity of small-pox nurses is used more often than any other to establish and support "belief in vaccination," and, that being accomplished, the need for infant vaccination is supposed to follow as a logical corollary. Indirectly, then, the immunity of small-pox nurses is certainly used as a strong argument for infant vaccination. (In this connexion I think that the antivaccinists are largely to blame. Most of them appear to base their case against vaccination on the ground that its supposed power to immunise against small-pox is a myth and a delusion. The provaccinists naturally reply by proving that it does immunise, and the immunity of small-pox nurses and doctors is the strongest possible evidence of this.)

7. *Absent Small-pox.*—Because I draw attention to the fact that small-pox prevalence and mortality have greatly declined during the past two decades, in spite of the simultaneous great decline in infant vaccination, Dr. McVail accuses me of adopting "one of the most obvious sophistries of the present-day antivaccinist." Here he does me a clear injustice. The antivaccinist asserts that "the less vaccination, the less small-pox." I have never done that. I agree, of course, with Dr. McVail that the true relationship is "the less small-pox, the less vaccination." But I do say—and I cannot think that Dr. McVail really differs from me in this—that such a conjunction, continued over a long period of years, enormously weakens the provaccinist claim that the reduced prevalence and mortality of small-pox are due, or even chiefly due, to infant vaccination.

8. *Tetanus and Vaccination.*—Under this heading Dr. McVail makes the most of two statements—neither of them at all material—once made by me on hearsay evidence, and which I afterwards admitted were erroneous. I do not complain. One cannot be too careful in verifying one's facts.

9. *Leicester.* (*a*) *Unfulfilled Prophecy.*—Dr. McVail complains that I have on several occasions (at least four) quoted his famous prophecy, published in "Vaccination Vindicated," when I have been referring to the Leicester experiment. I sincerely regret if my having done this has caused him any annoyance. I can assure him that I have quoted him so often solely because his prophecy, made in such a standard provaccinist text-book, so aptly and authoritatively expresses the view almost universally held by the medical profession when the Leicester experiment was begun as to what the result of the experiment would be. Such a quotation is valuable as proving the importance attached to the Leicester experiment at that time. Let me say further that I have not the slightest doubt that, had I then been a qualified medical man, I should myself have heartily endorsed Dr. McVail's prophecy which, in the light of the beliefs then held, was a perfectly reasonable and justifiable one. A more serious charge is that I have been guilty of "mangling" the passage in which the prophecy occurs. I admit that deliberately to cut out parts of a quotation with the object of distorting its meaning is a serious offence, but I suggest that all I have done was to shorten a rather lengthy passage by omitting a sentence (and indicating the omission) which I honestly considered was not material. Even with this omission the passage as quoted ran (in my book) to over 100 words. As regards his complaint that I have continued to give the abbreviated quotation since he took exception to it in his Milroy Lectures I can only say that it was unintentional. I read his Milroy Lectures, and very interesting they were, but either I overlooked this particular point, or had quite forgotten it. I will certainly be careful to observe his wishes in future and to give the passage in full.

(*b*) *The Method.*—I do not think that Dr. McVail is quite fair to me here, but will let it pass.

(*c*) *Mild Small-pox.*—I recognise that there is some justification for Dr. McVail's criticism of the statement in my book, "The Vaccination Question," p. 125, in which I attribute the progressive decrease in the fatality of the last four principal Leicester epidemics to the influence of sanitation, at least so far as the last two are concerned (between the second and third there was, as he points out, no appreciable reduction). If and when the book calls for a second edition I will modify the statement, and I thank Dr. McVail for drawing my attention to it, but the point has, of course, no direct bearing on my LANCET article.

In conclusion, may I express my warm personal regard for Dr. McVail, and my admiration and respect for his encyclopædic knowledge—the result of life-long study—of this question of small-pox and vaccination, especially on its historical side.

I do not think that there is really so much difference between us—at least not as regards fundamentals—as might appear on the surface. I, on my side, am inclined to think that the time has come when all that remains of compulsory vaccination might safely be discarded (in this country) and that some advantage would be gained thereby. He, on the other hand, does not think that that time has yet arrived, though he admits (in his Milroy Lectures) the possibility that it may come some day. Possibly I err on the side of over-confidence, or it may be that he is unduly cautious. Which view is right is for your readers to judge.—I am, Sir, yours faithfully,

Leicester, April 26th, 1924. C. KILLICK MILLARD

MYELOMA OF THE ALVEOLUS.

To the Editor of THE LANCET.

SIR,—In the last issue of THE LANCET Mr. P. B. Kittel reported an interesting case of myeloma in the upper jaw of a boy of 5½, commenting on the infrequency of this condition at that early age. By coincidence, a boy aged 13, has just been discharged from this hospital after operation for a similar condition. A small, warty growth appeared on the hard palate close to the alveolar margin some 12 months ago, since when it gradually increased in size. On admission there was a circular pedunculated papilloma about half an inch in diameter, with a smooth, flat, dark-red surface and rounded edge, growing apparently from the periosteum of the alveolar process between the first and second right bicuspid teeth, both of which were sound. X ray showed no osseous lesion. The tumour was freely excised by Mr. Arthur Cooke and on section showed the stroma and multinucleated cells typical of a myeloid sarcoma.

I am, Sir, yours faithfully,
ARTHUR B. SMITH, M.B., Ch.B. Edin.,
House Surgeon, Addenbrooke's Hospital,
May 5th, 1924. Cambridge.

MATERNAL MORTALITY IN CHILDBIRTH.

To the Editor of THE LANCET.

SIR,—To those of us who have been striving for the better education and training of the midwife, your leading article of April 19th with this title appears to give an entirely wrong impression of Dr. Janet Campbell's recent report (No. 25 of the Ministry of Health). Your article states: "Since the passing of the Midwives Act in 1902 it is a matter for regret that so little improvement, if any, has been noted in the maternal statistics. In a series of 256 unselected cases of puerperal fever recorded by Dr. Campbell, in an appendix to her report, it is noted that 102 cases occurred in the practice of midwives alone, as against 86 in which delivery was effected by a doctor"

What improvement in the maternity figures has taken place began at the beginning of this century, and though the Midwives Act came into force after then the improvement was maintained, reaching its maximum in 1917 to 1918, when the medical services were at their lowest and more work than usual was done by midwives. The disappointing high mortality of 1919 and 1920 was doubtless due to other causes than that of the type of the attendance on labour, and since then the figures have fallen near to the lowest level attained during the war.

The series of 256 odd cases from different districts given in Dr. Campbell's appendix, from which the conclusion is drawn that most cases occurred in the practice of the midwife, is particularly unjust. Those figures are clearly valueless for the purpose for which they are used. They are opposed to Dr. Campbell's own conclusion in regard to the relative responsibility of doctors and midwives, for she says: "There seems little profit, however, in attempting to apportion relative responsibility or blame" (p. 44). A much more reliable set of figures, given on page 32, are those of nearly 50,000 from the Q.V.J.I. midwives (undoubtedly a specially skilled body of women) with an average rate of 1·8 per 1000, or half the general rate for the country.—I am, Sir, yours faithfully,

Wimpole-street, W., May 6th. JOHN S. FAIRBAIRN.

DONATIONS AND BEQUESTS.—The late Mr. George Taylor Chadwick, of Harrogate, Yorks, left by will, among other bequests, £1000 to the Rochdale Infirmary.—The following bequest has been made under the will of the late Miss Amelia Halkett, of Ryde, Isle of Wight, and of Pitfirran, Fife: £1000, free of duty, to the Royal Isle of Wight Hospital to endow an "Arthur Halkett" bed or cot in the children's ward in memory of her nephew.—Miss Henrietta Emma Reeve, of Regent-terrace, N.W., left £2000 each to the Royal Free Hospital and to the Royal Hospital for Incurables, Putney; also £2000 to her medical attendant, Alfred Alexander Cummin Grant, in recognition of his kindness and attention to her late uncle, Charles Reeve, and herself.

Obituary.

FRANCIS WILLIAM CRAGG, M.D., D.Sc. EDIN.

BY the death on April 23rd from typhus, at the early age of 42, of Major F. W. Cragg, I.M.S., Assistant Director, Central Research Institute, Kasauli, the science of medical entomology has lost one of its ablest workers, and the Indian Medical Service a distinguished officer. It is tragic to recall that only a little more than two years ago this fell disease claimed as its victim another distinguished worker, Mr. A. W. Bacot. Details regarding the circumstances under which Cragg contracted the disease have not yet reached this country, but evidently he was deputed to investigate its ætiology (still a mystery) at Lahore, and, like Bacot, Cragg was alive to the danger of handling infective body lice, or coming into contact with lousy patients, but in some way at present unknown the virus passed into his system with fatal results. Every worker in this branch of experimental medicine knows only too well how easy it is to be bitten, or in some other way infected while handling large numbers of infective insects.

Francis William Cragg graduated M.B., Ch.B. in Edinburgh in 1905, and shortly after entered the Indian Medical Service. After a lengthy tour of military duty he came to Edinburgh on leave in 1910. He attended Prof. Ashworth's class of medical entomology and parasitology, giving much attention to zoological technique, and later under his direction took up the study of insect anatomy. His thesis for the degree of M.D., on "The Structure of *Hæmatopota pluvialis*," for which he was highly commended, is a model of descriptive anatomy. This piece of research was the foundation of Cragg's future work on medical entomology. Morphology, especially comparative morphology rather than systematic, was his bent, and he was a master of his subject. He was also deeply interested in the relation of insects to disease, and was well equipped to undertake research into the life-histories and methods of transmission of parasites. His knowledge of insect structure and of protozoology enabled him to avoid the many pitfalls in this particular line of research.

After returning to India in 1911 he applied for civil employ in the Jail Department, but soon found the work uncongenial, and then asked to be transferred to the Bacteriological Department. He was sent to the King Institute of Preventive Medicine, Guindy, Madras, where the writer first met him. At Guindy, with little routine work and unlimited material close at hand, Cragg was able to extend his knowledge of the comparative morphology of insects associated with or likely to be associated with disease-causing organisms. As a result of these researches he published a series of papers on "Studies on the Mouth Parts and Sucking Apparatus of the Blood-Sucking Diptera." These papers represent some of Cragg's best work on insect morphology, and show how quickly he arrived at an accurate interpretation of the mechanism of the parts studied. His beautiful line drawings enhance the value of these papers. At Guindy he also collaborated with the writer in several papers on descriptive entomology and bionomics, and one of these is the first paper in Volume I. of the *Indian Journal of Medical Research*. It was at Guindy that our joint work on "Medical Entomology" was conceived, planned, and carried out. Cragg's anatomical sections and his line drawings added greatly to the usefulness of the book as an introduction to the study of entomology. The completion of this work in about two years was only possible with Cragg's loyal coöperation.

In 1912, at his own request, Cragg was transferred to the Central Research Institute, Kasauli, where he continued to work until his death. It is possible here to mention only a few of his papers embodying original research of a high order in medical entomology; most of the papers will be found in the

volumes of the *Indian Journal of Medical Research*. His studies of the reproductive system of *Cimex*, with special reference to the behaviour of the spermatozoa, attracted considerable attention. The discovery by the writer of the method of copulation in *Cimex*, and its demonstration to Cragg, led him to investigate the interesting and peculiar phenomena connected with fertilisation in the common bed-bug. This work of Cragg opens up an entirely new field of inquiry. His observations on the geographical distribution of the Indian rat-fleas as a factor in the epidemiology of plague is a valuable piece of work. If it is eventually proved that the rat-flea *Xenopsylla astia* plays no part in the spread of the bacillus of plague, then Cragg's work will be of the utmost value in the fight against plague in India.

In his studies of the spread of parasitic diseases Cragg soon recognised the importance of relapsing fever as a factor to be reckoned with in the mortality returns of India. His paper on relapsing fever in the United Provinces and Oudh focused attention on the disease. During his investigation at Agra he contracted relapsing fever, and had to take leave to this country. He went to Edinburgh and, although poor in health, worked again in the zoological department at several problems, and obtained the degree of D.Sc. in 1922. On his return to India towards the end of 1922 he set to work on several important problems connected with the bionomics of fleas, lice, and the bed-bug, and he looked forward later to return to the investigation as to whether the flea *Xenopsylla astia* plays any part in the transmission of the bacillus of plague. But this was not to be.

Major Cragg was a fearless investigator, and he gave promise of adding much to our knowledge on insects in relation to disease. His loss is irreparable. A cheery companion, he will be sorely missed by his many friends.

To Mrs. Cragg, who was not able to be with her husband in his last hours, and to his two fatherless children, the deepest sympathy of the medical profession will be extended.

W. S. P.

GRANVILLE STANLEY HALL, PH.D. HARVARD, LL.D.

Dr. G. Stanley Hall, President Emeritus of Clark University at Worcester, Massachusetts, who died on April 24th, was born in 1845 of that New England stock which carries almost no infusion of other than English blood, and his boyhood was lived in straitened circumstances, but among the traditions associated with a Puritan upbringing. Following upon a college education in America he was enabled by far-seeing friends to spend three years of study in Germany, and, after holding a professorship at Antioch College and doing tutorial work at Harvard, he made a second long visit to Europe when he studied under Wundt, Ludwig, and Helmholtz. Then followed a professorship of psychology and pædagogy at Johns Hopkins University, and in 1888 he became head of the newly formed Clark University at Worcester. The difficulties of this position, when loyalty to the founder demanded a silence on vital matters which for a time alienated Stanley Hall's personal friends as well as those American scholars who had been attracted by the academic ideals of the new foundation, have only lately been made known, but the faith of a few saved the venture, and on his retirement in 1920 he could look back with pride upon its achievements.

Although his name was known to only a small circle in this country, Stanley Hall stood as a pioneer of psychological study in America. He was the first President of the American Psychological Association, and founded the *American Journal of Psychology* and the *Journal of Applied Psychology*. Last year he published, under the title of "Life and Confessions of a Psychologist," an analytical autobiography which revealed how his study of mankind, of man's place in nature, his origin and destiny, had become to him a source of almost religious comfort. He is, perhaps, best known to us by his work on "Adolescence," which appeared in 1904, and still stands well above the flood of literature on that or kindred subjects. Though never losing interest in experimental psychology, he was already becoming impatient with scholasticism, and even then wrote scornfully of "a bankrupt psychology without a soul," whilst demanding that the study of the mind should make contact with life at as many points as possible. Psychology touches so many of our beliefs and prejudices that he inevitably raised bitter criticism. He speaks in his "Life and Confessions" of the *odium sexicum* roused by his pre-analytical work on "Adolescence," and when he turned to psychoanalysis as to a new dispensation in normal psychology he was for more than a decade, as he expresses it, little more than *vox clamantis in deserto*. He himself regarded his best work as being the elaboration of the genetic view of mental development; introspectionists, behaviourists, and anti-psychoanalysts were for him in the pre-evolutionary stage through their failure to appreciate that the soul is as much a product of evolution as the body.

The *American Journal of Psychology* so recently as last January spoke of "this modern Aristotle," and expressed the hope of his former students and the friends of learning everywhere that he would be spared to finish those volumes he contemplated to complete his system. But Stanley Hall had already shown a calm expectation of the end when, after setting out his desire to accomplish something really worth while in the world, he wrote: "Yet all the time I know that the Supreme Queller may at any time now intervene and cut down all these aspirations as the mower does the last lush crop of rowan before the snow and ice of winter kill it at its very roots."

CHARLES ROBERT GRAHAM, M.R.C.S. ENG., L.R.C.P. EDIN.

IT was with great regret that the public of Wigan and surrounding districts heard of the death of Dr. C. R. Graham at the age of 67. Dr. Graham for over 40 years conducted an extensive practice in Wigan, and in 1919 he retired to Bolton-le-Sands, near Carnforth, where his death occurred on April 27th. After a general education at Wigan and Annan, he studied medicine at Owens College, Manchester, and at Paris, taking the M.R.C.S. Eng. and L.R.C.P. Edin. in 1878. Before commencing practice in his native town of Wigan, he acted as senior house surgeon at the Royal Berkshire Hospital, Reading, and as resident medical officer at the Hospital for Children at Pendlebury, Manchester. For 34 years he was one of the honorary surgeons to the Royal Albert Edward Infirmary, Wigan, and for other seven years was consulting surgeon to the same institution, thus establishing a record of 41 years' association with the Wigan Infirmary. For many years he acted as one of the surgeons of the Lancashire and Cheshire Miners' Permanent Relief Society and as medical adviser to other societies. He was a keen and expert angler and was regarded as an authority on fly-fishing. Dr. Graham leaves a widow, three daughters, and a son. One daughter and his son are members of the medical profession. Dr. Graham was held in the highest esteem in Wigan, and to many his death will come with a keen sense of personal loss.

EDWIN BEATON, M.D. CAMB.

Dr. Beaton, who died of pneumonia in Cairo at the early age of 43, was bacteriologist to the Public Health Department in that city. Son of the late Mr. Edwin Beaton, formerly chief constructor at the Admiralty, he was educated at Caius College, Cambridge, going on to St. Mary's Hospital. He took his Conjoint Board Diploma in 1906 and his medical degree at Cambridge in 1909. In 1923 he

took the M.A. and M.D. degrees. After filling one or two house appointments at St. Mary's Hospital he joined the staff of the inoculation department, where he worked until, a few months before the war, he was appointed to the laboratory staff of the Egyptian Public Health Service under Dr. Charles Todd. He continued in this service until his death. A colleague writes from the inoculation department, St. Mary's Hospital: "Edwin Beaton was held in affectionate regard by all those who worked with him here—and no less, as we well know, by his colleagues in Egypt. He joined us in 1910, and set to work on problems connected with the antitryptic power of the blood, which was just then beginning to attract attention. After much careful work on the elaboration of accurate micro-methods of measuring this function of the serum he applied these to the study of a great variety of pathological conditions. Probably he was the first to recognise the important fact that an increased antitryptic power is associated with every infection. Unhappily, he was too little anxious to publish his work—an expression of his very reserved nature—and in consequence a great many valuable observations lie buried in his note-books."

Throughout the war Beaton was kept fully occupied with the routine public health work of his department, but with the return of peace conditions he again turned his attention to the nature of the antitryptic power, publishing his observations in the *British Journal of Experimental Pathology* (1922, iii., 224). His M.D. thesis (not yet published) makes a further contribution to the same subject.

ARTHUR JOHN NYULASY, L.R.C.P. EDIN., M.R.C.S. ENG.

Dr. Nyulasy, who died recently at his brother's house in Melbourne, was well known as a surgeon and gynæcologist in Western Australia. He started life with the intention of becoming an engineer and obtained his certificate as surveyor before entering the Melbourne Medical School. He completed his medical studies at various centres in Europe, qualifying L.R.C.P. Edin. in 1890, and taking the English Conjoint qualification in the following year. Returning to Australia, he became assistant to his brother, Frank, at Toorak, Melbourne, migrating later on account of his health to Perth, where he built up a large general practice. He first attracted notice by a successful investigation into the origin of an epidemic of typhoid then prevalent in the district. During the South African War he served as medical officer with the contingent from Western Australia, and on his return was elected to the staff of the Perth Hospital, where he became in succession out-patient surgeon, surgeon, out-patient gynæcologist, and gynæcologist. Dr. Nyulasy retained throughout life his interest in anatomical study, and from the time of the Australasian Medical Congress in 1908 made it his endeavour to establish the view that the primary supports of the uterus are its ligaments, the pelvic diaphragm acting as a secondary support to prevent undue stretching of the ligaments from intra-abdominal strain. He took much time and trouble to familiarise his colleagues in Australia with recent advances in gynæcological technique. He stood for early operation in pelvic septic phlebitis, holding that serious cases of puerperal infection might be saved by early excision of the thrombosed veins. He was an advocate of the intestinal route of drainage in septic peritonitis, and recorded in our own columns in 1915 a series of six cases successfully so treated. He also described an original method of treating prolapse of the female bladder.

Dr. Nyulasy was a man of artistic tastes with some ability as a musician, whose loss leaves a gap among a large circle of medical and other friends in the Commonwealth. His death was due to malignant disease of the stomach, borne with great fortitude.

Medical News.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—At a meeting of Comitia on April 24th licences to practise were conferred upon the following candidates who have passed the Final Examination of the Conjoint Board:—

S. Abadir, King's Coll.; A. H. Abdel-Messih, Cairo and Manchester; M. C. V. Abraham, Manchester; J. N. Alexander, Guy's; H. G. Anderson, St. Bart.'s; J. H. Anderson, Manchester; F. Asker, R. T. Bannister, and V. Barkin, St. Bart.'s; P. Bauwens, St. Thomas's; Margarida R. Bensaude, Birmingham; M. Bersinski, Middlesex; H. B. Boucher, St. Thomas's; W. H. Bradley, Oxford and Guy's; R. A. Brews and S. G. Brown, London; J. R. Burrows, Liverpool; Edna V. Butler, Bristol; L. W. Cann and R. J. Cann, Guy's; J. A. Carman, London; A. M. Claye, Leeds; H. G. Close, Guy's; G. E. C. Collis, Univ. Coll.; R. F. Connell, Middlesex; Elizabeth M. Cowie, Royal Free; D. V. Davies, St. Thomas's; G. I. Davies, Univ. Coll.; Gwladys D. Davies, King's Coll.; E. C. Dawson, Birmingham; J. R. B. Dearden, Cambridge and St. Bart.'s; C. J. C. de Silva, Liverpool and Middlesex; C. H. Devereux, Univ. Coll.; B. Dons, St. Bart.'s; Ethel Downing, Royal Free and St. Mary's; E. F. Duck, Univ. Coll.; W. L. Dunlop, Liverpool; W. H. du Plessis, St. Thomas's; Kathleen H. Durance, Royal Free; L. C. Edwards, London; W. S. D. Elder, St. Andrews and St. George's; C. L. Elgood, Oxford and St. Bart.'s; A. Elliot-Smith, Cambridge and Univ. Coll.; S. W. Eveson, London; H. B. Flooks, Cardiff and Guy's; J. H. Francis, Cambridge and St. Mary's; A. T. Fripp, Oxford and Guy's; E. B. Garrett, Univ. Coll.; A. Gilberg, Middlesex; J. F. Goodenough, Guy's; C. A. H. Green, Oxford and St. Bart.'s; J. L. Griffin, Bristol; N. W. Hammer, Middlesex; I. Harris, Cardiff and Westminster; Greta Hartley, Royal Free; H. N. Hearle, Guy's; F. Heckford, St. Bart.'s; E. F. Hewlitt, Guy's; R. A. Hickling, Westminster; Florence R. Hodges, Royal Free and St. Mary's; Barbara M. Hope, King's Coll.; Margaret Hossell, Royal Free; L. W. Houghton, Guy's; D. V. Hubble, St. Bart.'s; M. W. P. Hudson, St. Thomas's; W. S. Hunt and I. M. Hurwitz, Guy's; Dorothy P. Hytch, Royal Free; E. Jacobson, Cape and London; J. P. W. Jamie, Cambridge and St. Bart.'s; D. Jones, London; D. S. M. Jones and H. M. R. Jones, Middlesex; I. S. Jones, Liverpool; R. Jones, Birmingham; A. Jowell, Cape and Guy's; Dorothy L. M. Keats, Royal Free; H. N. C. van G. Kelaart, Ceylon; A. C. King, London; F. H. King, Cambridge and St. Bart.'s; J. H. Kok, Utrecht and Middlesex; R. Langford, Cambridge and London; O. B. Lean and H. Lord, Univ. Coll.; Elsa P. Lunn, Birmingham; W. J. E. Lupton, Oxford and St. George's; E. M. McCausland, Middlesex; Lily C. MacKinnon, Charing Cross; W. W. McLean, Cambridge and St. Thomas's; J. G. McMenamin, St. Bart.'s; D. Magrath, Birmingham; Dorothy B. Marling, Royal Free and London; D. G. Martin, St. Bart.'s; W. A. Mill, Guy's; K. F. T. Mills, Cambridge and Middlesex; G. G. Milne, London; S. M. Milner, Cambridge and Manchester; W. E. Moody, Bombay and St. Mary's; G. O. Morgan, Cardiff and King's Coll.; E. G. Morris, Cambridge and St. Thomas's; Ethel W. Morris, London; L. N. Moss, Cambridge and St. Mary's; B. S. Mote, Bombay; G. Murray Shirreff, Bristol; M. Nazmi, Cairo and Univ. Coll.; E. V. Newling, Middlesex; Nancy B. Ockenden, Univ. Coll.; Doris M. Odlum, Royal Free and St. Mary's; G. F. S. Parker, Manchester; K. O. Parsons, Guy's; E. A. T. Pateman, Calcutta and Charing Cross; J. N. D. Paulson, Edinburgh and St. Mary's; J. F. Payan, Guy's; T. Peirson, Manchester; A. Perkoff, London; E. B. Pollard, St. Bart.'s; Winifred M. Proctor, Durham; Eleanor M. Pulleine, Royal Free and St. Mary's; F. K. B. Quanbrough, Bombay and St. Bart.'s; G. Ralston, London; M. A. Rana, Punjab and St. Mary's; R. H. T. Rea, Cambridge and St. Thomas's; T. S. Read, Cambridge and King's Coll.; Dorothy M. Rees, King's Coll.; E. J. Rees, Cardiff and St. Thomas's; C. B. Rich, Charing Cross; W. M. Roberts, Manchester; F. Robinson, Durham and Manchester; R. E. Robinson, Guy's; Dorothy W. Roughton, Royal Free and London; F. E. E. Schneider, Univ. Coll.; M. B. Seng, Guy's; T. H. Sims, Cambridge and St. Thomas's; I. Spiro, Liverpool and Univ. Coll.; C. R. Steel and G. G. Stewart, St. Bart.'s; M. H. Steyn, Amsterdam and St. Thomas's; G. E. F. Sutton, King's Coll.; H. Taylor, London; J. H. G. Thompson, Cambridge and St. Thomas's; P. H. T. Thorlakson, Manitoba; W. G. Thwaites, St. Thomas's; R. J. Toleman, Cardiff and London; A. Tom, Guy's; Mary M. Turnbull, King's Coll.; Cicely N. Twining and Hermione M. Usborne, Royal Free; G. M. Wadsworth, Leeds; J. L. Warner, Cambridge and Middlesex; P. B. Wilkinson and T. M. Wilks, King's Coll.; D. H. Williams, London; G. Williams, St. Mary's; Dorothy Wood, Charing Cross; T. E. W. R. Wood, B. H. H. Wooderson, and H. G. Wyatt, London; and Z. M. Yusuf, St. Bart.'s.

Diplomas in Tropical Medicine and Hygiene were granted, jointly with the Royal College of Surgeons of England, to the following candidates:—

Monawar Khan Afridi, Edward H. Black, Surendranath E. Borah, Clifford V. Braimbridge, Nariman Hormusji Cutwa'a, Anant Yashwant Dabholkar, Mary Ellison, Lily G. Iliff, John G. Johnstone, Frederick Stevenson, and Edward S. Walis.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates passed in the subjects indicated :—

Surgery.—H. L. Bernstein, Guy's Hosp.; P. V. Casling, St. Mary's Hosp.; E. J. R. MacMahon, St. Thomas's Hosp.; I. Morgan, St. Mary's Hosp.; W. T. Swanton, Univ. Coll., Cork, and Charing Cross Hosp.; and W. J. Wood, University of Leeds.

Medicine.—F. Beinaschewitz, University of Bern; R. Hare, St. Mary's Hosp.; W. M. Jones, St. Bart.'s Hosp.; J. N. Wheatley, London Hosp.; and W. J. Wood, University of Leeds.

Forensic Medicine.—W. B. Arnold, St. George's Hosp.; A. J. M. Davies, St. Mary's Hosp.; J. Herbert, Guy's Hosp.; W. R. S. Jaecques, Louvain and Ghent; and J. N. Wheatley, London Hosp.

Midwifery.—E. H. Boodrie, St. Mary's Hosp.; W. R. S. Jaecques, Louvain and Ghent; A. Kotbi, St. Mary's Hosp.; D. G. Robinson, Guy's and Charing Cross Hosps.; and G. H. Shanley, Durham.

The Diploma of the Society was granted to the following candidates entitling them to practise medicine, surgery, and midwifery: P. V. Casling, W. M. Jones, E. J. R. MacMahon, I. Morgan, D. G. Robinson, J. N. Wheatley, and W. J. Wood.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—The following candidates have passed the Triple Qualification Examination and have been admitted as licentiates:—

Wilfred A. Bartholomeuz, Douglas M. Beaton, John S. Caldwell, Matthew Clouts, John C. Colvin, James Courtney, Charles J. Coventry, Frederick W. Duthie, Herbert M. Hobson, Bruce F. Home, William D. Howat, John A. A. Hunter, Morris Kelman, Douglas J. Kynoch, Douglas D. O. M'Loughlin, Harry Myers, George C. Philips, William J. Rankine, Frederick W. Robinson, Israel Rostowsky, Robert D. Scorgie, Geoffrey H. Sellers, and Annie H. Sutherland.

UNIVERSITY OF GLASGOW.—At the graduation ceremonial on April 23rd the following degrees were conferred :—

M.D.—Margaret H. Grant (with commendation), John M. W. Morison (with commendation), Thomas D. Miller, and Elaine B. S. Stocquart.

M.B., Ch.B.—With honours: William Thomson, Henry S. Russell, and David Hynd. With commendation: Andrew S. Barr, Francis D. Morphy, John Montgomery, Thomas A. Fyfe, John C. Alexander, Robert Graham, Adam D. Mack, Robert A. Kennedy, Archibald Brown, James Ross, John G. M'Whirter, James Morison, Hector Macdonald, Charles M. Brown, Robert Black, John A. M'Gregor, James M'Fadzean, Kenneth A. Mackay, James C. Gillies, Robert G. Cochrane, and John Adam.

Robert H. Abercrombie, William G. Allan, Margaret M. Allison, Janet H. Anderson, John Anderson, William C. Armstrong, William G. Arthur, John W. Baxter, Samuel Baxter, Mary V. F. Beattie, John Beck, John S. Bell, Marion H. Black, Andrew Bowie, Janet S. Brooks, Alexander Brown, Andrew Brown, David K. Bruce, James Caldwell, Alexandrena F. Cameron, Douglas Cameron, Duncan MacG. Cameron, Robert M. Chalmers, George Collier, Hew B. Cordiner, Arthur L. Cowan, James Crawford, Janet I. A. Cullen, John Cumming, Donald E. S. Cunningham, Robert E. Davie, Slavoljub S. Djordjevitch, Robert S. Doig, Robert S. Donaldson, Lily S. Duncan, George H. Edgecombe, Norman F. Edgecombe, Harold Fairbairn, Christina G. Findlater, Donald MacD. Fraser, Thomas Fulton, Finlay MacR. Fyfe, Lachlan H. Gilchrist, William Gilchrist, William Gillespie, William N. M. Goldie, Oliver Gray, Robert A. Gray, Andrew A. Grierson, Gordon L. Grieve, Reginald K. Hanlin, David M. Harper, William A. Harper, Thomas Heffron, John D. Hempseed, Gertrude Henderson, Mary Hendrie, John W. M. Humble, Alexander M. Innes, George C. Kelly, Duncan L. Kerr, Hugh F. Kerr, Ralph A. W. Kerr, William A. Kerr, Alexander Kirk, William E. Laing, Sarah D. Lamb, Angus Lamont, James R. Langmuir, Andrew Law, Edwin S. Lawrie, Erik W. Lindeberg, Stuart Lindsay, John Lithgow, Thomas C. Lonie, William M'Adam, Eric M. MacAlpine, Peter A. M'Arthur, Archibald Macbeth, John M'Bride, Charles C. M'Callum, Michael M'Cann, Robert B. M'Coll, Edward W. M'Cormick, Ian J. M'Cormick, Ian M'Cracken, Alistair M'Crone, Archibald W. M'Crorie, John Macdonald, Kenneth M. Macdonald, Roderick Macdonald, James W. M'Gowan, Charles L. M'Harg, Douglas D. M'Ilvean, Alexander Macinnes, Richmond M'Intosh, William M'Intosh, Donald N. Mackinnon, Edward J. MacKinnon, Allan Maclaine, Alan H. Maclean, Angus Maclean, Angus J. M'Lellan, William A. M'Lennan, Katharine G. C. Macleod, Peter J. Macleod, Archibald Macmillan, David B. M'Millan, John S. M'Millan, Robert J. M'Nab, Ronald M. Macphail, Donald M'Phee, Loudon MacQueen, John A. M'Quistan, Florence C. Macrae, David M. M'Swan, Archibald R. M'Whinney, Andrew V. Magee, William B. G. Mair, Andrew Marshall, Rhoda W. Marshall, Walter M. Martin, James A. Matheson, Felix P. Meehan, Mary A. J. Melville, George A. Mitchell, John O. Moffat, David A. Montgomery, Shiona A. Muir, James H. Murdoch, John M. Murray, Frederick J. Newall, John W. Nicolson, Murdo Nicolson, Hugh C. Orr, Elsie H. Parker, Thomas Paton, William Patrick, Elisabeth A. Pennycuick, Findlay Pettigrew, Robert W. Rae, James S. Ralston, William A. Ramsay, Archibald K. Rankin, Benjamin Reid, George S. Reid, Robert H. Reid, Robert H. Reid, Andrew C. Richmond, Alexander Robertson, Alexander M. Robertson, James Scott, Walter J. Scott, William Shankland, Thomson D. Shanks, George I. Shaw, John S. Smith, William S. Stephen, Adam Stewart, Hugh Stewart, James P. Stewart, Mary L. Stewart, Thomas T. Stocker, George J. Summers, Alison L. Taylor, George L. Thomson, James M. Thomson, Jared Totten, Dorothy A. Towart, James G. S. Turner, John W. Tweddle, Adeline G. Vallance, William B. Wallace, James A. Watson, Douglas J. B. Wilson, George L. Wilson, John W. Wilson, Sarah B. Wilson, Ruby E. Winning, Robert M. Wylie, Ida Wyllie, and James W. Young.

THE Prince of Wales has become Patron of the London Homœopathic Hospital, Great Ormond-street, W.C., and the Duke of York President, in succession to Lord Cheylesmore, who becomes Vice-President.

MEDICAL PRAYER UNION.—The annual medical missionary breakfast will be held on Wednesday, May 14th, at the Refectory, University College, Gower-street, W.C., at 8 A.M., under the presidency of Mrs. Scharlieb, M.D. An address will be given by Dr. J. A. Liley, of Tangier. An intimation of intention to be present will be welcomed by Dr. Tom Jays, the hon. secretary, Livingstone College, Leyton, E. 10.

MEDICO-PSYCHOLOGICAL ASSOCIATION.—The next quarterly meeting of the Medico-Psychological Association of Great Britain and Ireland will take place on May 22nd, at 11, Chandos-street, Cavendish-square, London, W., under the presidency of Lieut.-Colonel E. Goodall, at 2.30 P.M. Dr. J. Carswell will deliver the Fifth Maudsley Lecture at 3 P.M., at the House of the Royal Society of Medicine. The subject of the lecture will be Some Sociological Considerations bearing upon the Occurrence, Prevention, and Treatment of Mental Disorders.

ROYAL INSTITUTION.—The annual meeting of the members of the Institution was held at Albemarle-street on Thursday, May 1st, Sir James Crichton-Browne, Treasurer and Vice-President, in the chair. The annual report of the committee of visitors for the year 1923, testifying to the continued prosperity and efficient management of the Institution, and the report of the Davy Faraday Research Laboratory Committee, were read. It was stated that 53 new members were elected during the year, and 63 lectures and 18 evening discourses were delivered. Sir James Crichton-Browne was re-elected as treasurer, and Sir Arthur Keith as secretary. The board of managers includes Dr. J. Mitchell Bruce, Mr. Ernest Clark, and Sir Charles Parsons.

CENTRAL ASSOCIATION FOR MENTAL WELFARE.—A conference on Mental Deficiency will be held in the Central Hall, Westminster, London, S.W., on Wednesday and Thursday, May 28th and 29th. At the morning session on Wednesday (10.30 A.M.), Sir Leslie Scott, M.P., in the chair, an inaugural address will be given by Mr. J. Wheatley, Minister of Health, followed by papers on the Best Methods of dealing Administratively and Educationally with the Mentally Defective (Feeble-minded) Child, by Dr. H. B. Brackenbury and Mr. E. Salter Davies, and at the afternoon session (2.30 P.M.) by Dr. H. Herd. On Thursday, at 10.30 A.M., Dr. W. A. Potts will be in the chair, and a paper on the Influence of Heredity and Environment in Causing Mental Deficiency will be read by Dr. A. F. Tredgold. In the afternoon, at 2.30, a paper and address on Mental Tests—their Value to the Medical Officer, the Educationalist and the Social Worker, will be given by Dr. Cyril Burt and Dr. Robert Hughes, with the Rev. Principal Thomas in the chair. At each session there will be a discussion on the papers read.

THE LATE DR. H. A. BULL.—Harry Ashworth Bull, L.R.C.P. Lond., who died in a London nursing home on April 19th at the age of 52, after an operation, was a well-known practitioner of Great Haywood, Staffordshire. He was surgeon to the Rugeley District Hospital, and in 1901 was appointed public vaccinator for the Colwich District of the Staffordshire Union, and later took over the duties of medical officer for that area. He was also medical officer of the Sister Dora Convalescent Hospital at Milford. Keenly interested in any kind of public work which had a medical bearing, Dr. Bull was a prominent figure at meetings of tuberculosis and insurance committees, where his medical knowledge was always an asset in the debates. He was a member of the Staffordshire County Council, the Staffordshire, Wolverhampton, and Dudley Joint Tuberculosis Committee, the Staffordshire Insurance Committee, and the Staffordshire Mental Hospitals Board, and was a representative governor of the county grammar school. During the late war Dr. Bull was employed at the German prisoners' camp at Brocton, and the ill-health by which he had been handicapped for some time probably dated from this period of strenuous work. He leaves a widow, a son, and two daughters.

MEDICAL GOLFING SOCIETY.—In the final of this Society's "knock-out" tournament, Mr. Murray Thomson defeated Mr. T. P. Kolesar 2 and 1. The other semi-finalists were Dr. Cyril Ilott and Dr. T. B. Jobson.

LEAGUE OF REMEMBRANCE (1914–1919).—A meeting of the Medical Advisory Board of this League will be held at 1, Marlborough Gate, London, W., on May 13th, at 5 P.M., when Princess Beatrice will preside.

Dr. Hubert J. Norman will deliver an address on Insanity and Conduct at a meeting of the Ethological Society to be held at 90, Buckingham Palace-road, London, S.W., on Monday, May 12th, at 8.30 P.M.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.—A meeting will be held at the Miller General Hospital, Greenwich, on Friday, May 16th, at 8.45 P.M. Dr. E. G. Annis, the President, will occupy the chair, and will deliver an address entitled Old-fashioned Epidemics. A smoking concert will follow.

CHADWICK PUBLIC LECTURES.—To-day (Friday), May 9th, at 5.15 P.M., Prof. MacBride, F.R.S., will give a lecture on "Some Causes of a C3 Population." The lecturer will describe the theory of mutations, and make suggestions as to causes of abnormalities which may be operative in producing C3's. This lecture will be given in the Hall of the Royal Society of Arts, John-street, Adelphi. Dean Inge will take the chair. The history and present position of Women in Dangerous Trades will be set forth by Miss Constance Smith, H.M. Deputy Chief Inspector of Factories, on May 27th, at 8 P.M., in the Lecture Hall of Bedford College, Regent's Park, London, N.W. The last lecture of the programme will be given in the Chelsea Physic Garden, Swan Walk, Chelsea Embankment, on June 4th, at 5 P.M., by Sir David Prain, on Economic and Hygienic Relationships of Cinchona Bark and Quinine. Further information about Chadwick Lectures may be obtained of the Secretary, Mrs. Aubrey Richardson, at the offices of the Trust, 13, Great George-street, Westminster, London, S.W.1.

BRITISH EMPIRE CANCER CAMPAIGN.—On Tuesday, May 6th, a meeting in support of the campaign was held at the Mansion House, London. The Lord Mayor, who was in the chair, announced that a special effort would be made in the City of London to provide a substantial addition to the funds of the campaign now available for cancer research. The Duke of York appealed for unremitting effort in combating the scourge which probably throughout the world accounts for more than half a million deaths annually. Sir John Bland-Sutton said that independent workers should be given facilities for work in established laboratories, and that the money which was given to help fight the cause of cancer would enable experts to be freed from the cares of practice and to devote their time to research. Prof. W. S. Lazarus-Barlow was of the opinion that the work would proceed along the lines of radium and X ray treatment, and he mentioned the curious power which existed in certain persons suffering from cancer to hold it in equilibrium for a number of years and on rare occasions to conquer it. Mr. J. Beaumont Pease said that £84,000 had already been subscribed, including an anonymous donation of £20,000 to meet expenses, so that the money subscribed by the public might be directly devoted to the campaign. Mr. J. P. Wheatley said that from inquiries made by the Ministry of Health in urban districts, they knew that not more than 50 per cent. of the people afflicted with cancer applied for treatment at all and that many others only applied when they were inoperable, and he urged the importance of preventive work. Lord Cave, Chairman of the Grand Council, said that they wanted to support all institutions which were studying the problem.—Among recent gifts to the British Red Cross Society for its campaign against cancer is the sum of over £279, the proceeds of the sale of the lathes and tools from the late Lord Hotham's private workshops. The British Red Cross Society has also received two anonymous gifts totalling £1500 and several donations of £100. Gifts to the campaign fund may be sent to the Hon. Sir Arthur Stanley, 19, Berkeley-street, W.1, cheques being made payable to the British Red Cross Society, and crossed "British Empire Cancer Campaign."

QUEEN CHARLOTTE'S MATERNITY HOSPITAL.—On Monday, April 28th, Lord Howard de Walden presided at the annual meeting of this hospital, when it was announced that a Supplemental Charter of Incorporation had been granted by which the name of the hospital was changed from Queen Charlotte's Lying-in Hospital to Queen Charlotte's Maternity Hospital, and women became eligible for election on the committee of management. Lady Howard de Walden, Mrs. M. E. Christie-Miller, Mrs. Ernest Dent, and Mrs. Walter Seligman were among the first to be elected members of the committee. The annual report shows that while there is some improvement in the financial position much remains to be done before the hospital is free from debt. The number of patients admitted to the wards during 1923 was 1936 as compared with 1820 in 1922, while the patients visited in their own homes by the hospital midwives and medical officers numbered 2132 as compared with 2173 in 1922. The report refers to the gratifying fact that there were no maternal deaths among "district" out-patients during the year. In moving the adoption of the report, Lord Howard de Walden said that there had been an increased number of patients during the year, a large number of whom were emergency cases. He had hoped that the governors would have been able to enter on a rebuilding scheme, but they had found the difficulties greater than they had anticipated. To reduce the large overdraft at the bank the committee were reluctantly obliged to borrow £8000 secured on the hospital freehold, and it now amounted to £6540. They would have to do their best to raise the balance, and the committee wished to point out that the hospital was still in debt to the amount of £17,000. The report was adopted.

MANCHESTER HOSPITALS AND THEIR "OUTSIDE" PATIENTS.—An interesting question is being discussed in the Manchester local press as to whether too large a proportion of the beds in the voluntary hospitals are allocated to patients coming from outside the boundaries of the City of Manchester and the Borough of Salford. From the published statistics, the return for 1922—the latest available data, it appears that the total number of cases treated in Manchester and Salford hospitals was 262,208, and of these 40,629 cases came from outside areas—i.e., about 1 to 6·5—which proportion, it is stated, the hospital authorities do not regard as excessive, having regard to the fact that a very large number of the 40,000 are what are called specialist cases sent to the local hospitals for special treatment. There is, however, another aspect of the question—viz., the financial one. Do these "outside," and in some cases distant, districts from which these patients come contribute adequately for the treatment which such patients receive? The 1922 report shows that the expenditure for all the local hospitals was £341,288, while the corresponding ordinary income was £288,854, leaving a deficit for that year of £52,434. The cost to the local hospitals of the 40,000 "outside" cases was £95,735 and the corresponding contributions £44,461, leaving a deficit of £51,274, so that of total deficit of £52,434, £51,274 was due to patients sent from outside districts, while Manchester and Salford paid for their own patients except to the amount of £1159. Although through local efforts substantially increased contributions have been obtained from the outlying districts in Lancashire and Cheshire, in view of the above facts, if outside patients are to come to the local hospitals in such proportions, it is urged that something must be done to secure much more liberal contributions from these districts.

Parliamentary Intelligence.

HOUSE OF COMMONS.

TUESDAY, APRIL 29TH.

The Tuberculosis Order 1914.

Sir THOMAS INSKIP asked the Minister of Health whether he intended to revive the Tuberculosis Order of 1914 (Order, No. 883, dated June 23rd, 1914, which was suspended by Order, No. 1215, of 1914), in view of the urgent necessity of enabling local authorities to take adequate steps to combat the disease of tuberculosis.

Mr. WILLIAM JOWITT asked the Minister of Agriculture whether, in view of the large payments contributed by the Exchequer to schemes in connexion with tuberculosis and in view of the fact that infection was largely due to bovine tuberculosis, he would consider the advisability of bringing into force the Tuberculosis Order, 1914.

Mr. BUXTON replied: I am giving careful consideration to the question of reintroducing the Tuberculosis Order of 1914, but I am not yet in a position to make a statement on the subject.

R.A.M.C. Officers' Leave at Woolwich.

Mr. PENNY asked the Secretary of State for War whether he was aware that leave to the medical officers of the Royal Army Medical Corps in the Woolwich district had been stopped owing to shortness of staff, and that much discontent had been caused thereby; and what steps were being taken to rectify and overcome the great lack of candidates for this important arm of the service, the present conditions of which were not considered sufficiently attractive.—Mr. WALSH replied: No leave of officers of the Royal Army Medical Corps at Woolwich has been stopped,

but three officers have had their leave postponed for a short period owing to sickness or other causes. As regards the last part of the question, I can assure the hon. Member that the matter is receiving careful consideration, although I am unable to make any statement at present.

WEDNESDAY, APRIL 30TH.

Flogging in the Navy.

Mr. THOMAS JOHNSTON asked the Civil Lord of the Admiralty if flogging had been re-established in the Navy for certain offences; if he was aware that flogging was dismissed as no satisfactory deterrent in the Report on Juvenile Delinquency, 1920; and if he would consult with some persons eminent in psychology, physiology, and in the dealing with youthful offenders, such as a London stipendiary magistrate, before he longer permitted a continuance of this practice.—Mr. AMMON replied: Boys convicted by court martial of certain serious offences are punished by birching. After careful inquiry I am satisfied that it would not be an advantage to abolish the punishment.

Mr. JOHNSTON asked whether the careful inquiry had included a report on the subject by Dr. James Glover, an eminent authority on psychology, and, if not, would the hon. gentleman consider that report if he sent him a copy.

Mr. AMMON: I have already stated that on my own initiative when I went to the Admiralty I went into this matter with the intention of seeing if flogging could be abolished. After going fully into the case and taking evidence I came to the conclusion that on the whole such abolition would be disadvantageous.

Viscount CURZON: Is it not the fact that the birch for the flogging of boys in the Navy has never been used except for serious sexual offences and that there is no feeling whatever on the part of the lower deck about it.

Mr. AMMON: I have already stated that it is only for very serious sexual offences, and there have only been six cases since 1917.

THURSDAY, MAY 1ST.

Royal Commission on National Insurance Terms of Reference.

Sir KINGSLEY WOOD asked the Prime Minister the terms of reference of the Royal Commission to inquire into national insurance, and the names of the members of the commission.—Mr. WHEATLEY replied: The following terms of reference have been agreed with representatives of the medical profession and the committee appointed for the purpose by the Approved Societies Consultative Council:—"To inquire into the scheme of National Health Insurance established by the National Health Insurance Acts, 1911–1922, and to report what, if any, alterations, extensions or developments should be made in regard to the scope of that scheme and the administrative, financial and medical arrangements set up under it." I am not yet in a position to announce the names of the members of the Commission.

The Germ of Foot-and-Mouth Disease.

Mr. MACFADYEN asked the Minister of Agriculture whether he had any information as to the alleged discovery by two German investigators, Dr. Dahmer and Prof. Frosch, of the germ of foot-and-mouth disease.—Mr. BUXTON replied: Such information has been received, and it is understood that full details as to these investigations will be published in the near future.

Recreation for Elementary School-children.

Mr. EDMUND HARVEY asked the President of the Board of Education whether he was able to take any fresh steps to encourage local education authorities in urban areas to make fuller provision for organised recreation for the children in elementary schools by acquiring new playing fields and by the better use of existing opportunities, and, in particular, for the utilisation of municipal tramways to convey scholars to parks, playing fields, and swimming baths at hours when the tramcars are not fully used by the travelling public.—Mr. C. TREVELYAN replied: Local education authorities are, I think, aware that the Board are quite prepared to encourage the activities mentioned by my hon. friend. I am always prepared to consider suggestions for their more extensive development.

Part-time Medical Officers of Prisons.

Lieut.-Col. FREMANTLE asked the Secretary of State for the Home Department (1) which were the prisons staffed by part-time medical officers; what were the present salaries of these officers; and on what basis were they arrived at. (2) In what respect had the closing of prisons increased the work and responsibility of the part-time medical officers at the remaining prisons; and whether it was proposed to increase their remuneration accordingly.—Mr. HENDERSON replied: The prisons and salaries are as follows:—Manchester, £300; Hull, £250; Winchester, Newcastle, Bristol, Cardiff, Lincoln, Preston, Durham, Borstal, Aylesbury, and Portland, £200 each; Leicester, Swansea, Shrewsbury, Portsmouth, Gloucester, Nottingham, Norwich, Exeter, Bedford, Wakefield, Oxford, and Dorchester, £150 each; Ipswich, Shepton Mallet, and Plymouth, £100 each. In fixing the salary the population of the prison is the basis, unless there are some special features justifying special consideration. The closing of eight prisons in March, 1922, has caused some increase in the population of some of the remaining prisons, and in one instance the salary of the part-time medical officer was increased. In the remainder the additional population has not so far been sufficient to justify an increase, but except where there has been an increase of this or other special grounds a temporary bonus is drawn.

Workmen's Compensation Medical Referees.

Mr. THOMAS WILLIAMS asked the Secretary of State for the Home Department if he was aware that the registrar of a county court in Yorkshire was appointing as medical referees under Section 11 of the Workmen's Compensation Act, 1923, doctors who were permanently employed as compensation doctors for certain coal-owners and the Yorkshire Coal-owners' Mutual Indemnity Company, Limited, to adjudicate in cases of dispute between other Yorkshire coal-owners whose workmen were insured by the Yorkshire Coal-owners' Mutual Indemnity Company, Limited, and workmen; and, as this had been brought to the notice of the registrar without result, would he inquire into the same and give instructions that medical referees appointed under Section 11 should in no case be doctors who were employed permanently by either coal-owners, coal-owners' mutual indemnity companies, or trade-unions affected.—Mr. HENDERSON replied: I am not aware of any such case. In the only instance brought to my notice it appeared on inquiry that the allegation was not borne out. It is a condition of the appointment of a medical referee that he shall hold no permanent employment of the kind referred to in the question.

MONDAY, MAY 5TH.

Plague in the Punjab.

Mr. WARDLAW-MILNE asked the Under Secretary of State for India if he would give the House any further information regarding the outbreak of plague in the Punjab.—Mr. RICHARDS replied: The Government of India have reported that 11 districts out of the 29 in the Punjab are infected, and that the mortality from Jan. 1st to the end of March is estimated at 38,000, including 25,000 deaths in March. Figures for the first two weeks of April have not yet been received, but in the week ending April 19th there were 12,393 deaths. The epidemic is less severe than in 1902, 1904, 1905, 1907, and 1915, but has assumed alarming proportions. The measures taken are chiefly directed towards inoculation and disinfection. Funds have been provided for additional staff in each infected district and for the adequate supply of plague vaccine. A vigorous inoculation campaign has been undertaken and resulted in 30,000 inoculations weekly for a considerable period. The total number of inoculations to April 19th was over 236,000, which is a greater number than in any previous year since 1903. Conditions will favour a decline of the epidemic in the present month. A decline had set in in the Southern Punjab by the middle of April.

Reports on Small-pox Outbreaks.

Mr. GEORGE OLIVER asked the Minister of Health whether in cases where notification of an outbreak of small-pox had occurred any special report as to the sanitary conditions of the property or neighbourhood was made to his department.—Mr. WHEATLEY replied: No such special reports are made to my department as a matter of routine, but when an outbreak of small-pox is investigated by one of my medical officers he reports as to all the circumstances affecting the outbreak.

TUESDAY, MAY 6TH.

Detention at a Mental Hospital.

Lord HENRY CAVENDISH-BENTINCK asked the Secretary of State for War whether he could explain why Lieut. C. H. Clendining, 3rd Battalion Royal Irish Rifles, who was detained as an alleged mental case at the station hospital, Cawnpore, during September 1917, was permitted to retain in his possession a sporting gun, revolver, and ammunition, and to leave the hospital to go out shooting in the jungle; and if he was aware that this officer was placed in hospital without being examined by any medical officer.—Mr. WALSH replied: With regard to the first part of the question I have at present no information before me. With regard to the latter part, I understand from Lieut. Clendining's own account that he was ordered to hospital by the senior medical officer after examination. As I informed the hon. Member for Dartford on March 4th last, the Army Council are awaiting the report of the Government of India

before investigating the case in accordance with the procedure laid down in Section 42 of the Army Act for dealing with the complaint of any officer who considers himself wronged. I understand that the report in question has just been received by the India Office and is being communicated to the War Office.

River Pollution in Fife.

Mr. DUNCAN MILLAR asked the Secretary for Scotland whether his attention had been drawn to the serious pollution of the river Leven in Fife; and whether, in view of the danger to public health thereby created, he was prepared to take steps to secure the proper treatment of the effluents from factories and works discharging into the river, so as to permit of its purification.—Mr. ADAMSON replied: My attention has been called to the pollution of the river Leven. The initiative in such cases rests with the local authorities, who are empowered with the consent of the Scottish Board of Health to take proceedings against offenders. In the event of a refusal on the part of a local authority to prosecute, any person interested may apply to the Board, who are thereupon required to hold an inquiry and may thereafter direct the local authority to institute proceedings.

Royal Commission on National Insurance.

Sir KINGSLEY WOOD asked the Prime Minister whether the character of the Royal Commission to inquire into national insurance had now been determined; and when the same would be constituted.—Mr. GREENWOOD replied: My right hon. friend regrets that he is not yet in a position to make a statement on the subject referred to by the hon. Member, but will do so as soon as possible.

Pension Final Awards.

Mr. EGAN asked the Minister of Pensions what steps he had taken to meet the serious complaint that, in cases where the final award was set aside on appeal to the pensions (assessment) appeal tribunal, the Ministry took no further action in the case.—Mr. J. W. MUIR replied: My right hon. friend has caused instructions to be issued to the effect that in all cases of this nature the officer or man concerned shall be re-examined, as soon as possible after the decision of the Tribunal, by a medical board with a view to the award of any further compensation which his condition may justify.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Tuesday, May 13th.

PSYCHIATRY: at 8.30 P.M.
Annual General Meeting:
Election of Officers and Council for 1924–25.
Discussion:
On Proposed Changes in the Law Regarding Criminal Responsibility of the Insane, to be opened by Mr. Donald Carswell.

Wednesday, May 14th.

SURGERY: SUBSECTION OF PROCTOLOGY: at 6 P.M.
Annual General Meeting:
Election of Officers and Council for 1924–25.

Thursday, May 15th.

DERMATOLOGY: at 5 P.M. (Cases at 4 P.M.)
Annual General Meeting:
Election of Officers and Council for 1924–25.
Cases:
Dr. Knowsley Sibley: Case of Disseminated Lupus Erythematosus.
Dr. G. Pernet: Porokeratosis.
Dr. H. Semon: Case of Livedo Annularis (a rare type, with sections).
Other cases will be shown.
Paper:
Dr. Civatte (Paris): Psoriasis (illustrated by microscopic sections).

Friday, May 16th.

ELECTRO-THERAPEUTICS: at 7.30 P.M.
Annual General Meeting:
Election of Officers and Council for 1924–25.

ROYAL INSTITUTION OF GREAT BRITAIN, Albemarle-street, W.
TUESDAY, May 13th.—5.15 P.M., Prof. Joseph Barcroft: The Effect of Altitude on Man. (Lecture III.)

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, Chandos-street, W. 1.
THURSDAY, May 15th.—8.15 P.M., Prof. Warrington Yorke and Dr. J. W. Scott Macfie: Observations on Malaria made during the Malaria Treatment of General Paralysis. (Preceded, at 7.45 P.M., by a demonstration.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, May 12th, to SATURDAY, May 17th.—CENTRAL LONDON OPHTHALMIC HOSPITAL. Mon., 2 P.M., Mr. Oliver: Plastic Operations on the Eyelids. Tues., 2.30 P.M., Mr. Gibb: Iritis. 4.30 P.M., Mr. Williamson-Noble: Inflammation of the Eye. Pathology. Thurs., 2.30 P.M., Mr. Cunningham: Interstitial Keratitis. Fri., 4.30 P.M., Mr. Neame: Squint.—CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL. Special intensive c urs.—INFANTS HOSPITAL. Mon., May 12th, to Sat., May 24th. Special Course in Infants' Diseases (for Medical Officers of Welfare Centres and others). 2 P.M. to 5 P.M. daily.—LONDON LOCK HOSPITAL. Clinical work daily. Lectures at Dean-street: Mon., 5 P.M., Mr. Gibbs: Treatment of Syphilis. Tues., 2.30 P.M., Mr. McDonagh: The Theory and Practice of the Treatment of Syphilis. Wed., 5 P.M., Mr. Lindsay Rea: Ophthalmia Neonatorum, its Recognition and Treatment. Thurs., 2.30 P.M., Mr. W. Victor Corbett: Practical Demonstration of Tests Used in Syphilis and Gonorrhœa. Fri., 4 P.M., Mr. Johnston Abraham: Late Sequelæ of Gonorrhœa in the Female.—ST. MARK'S HOSPITAL FOR DISEASES OF THE RECTUM. Operations, clinical demonstrations, and lectures will be in progress during the day.—MAUDSLEY HOSPITAL. Mon., 3.30 and 5.30 P.M., Dr. Bernard Hart: The Psychoneuroses. Tues., 2.30 P.M., Dr. F. C. Shrubsall: The Practical Aspect of Mental Deficiency. 4.30 P.M., Sir Frederick Mott: The Pathology of Mental Diseases. Wed., 2.30 P.M., Dr. E. Mapother: Demonstration in Clinical Psychiatry.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, May 12th.—11 A.M., Surgical Registrar: Surgical Wards. 12 noon, Mr. Simmonds: Demonstration of Fractures. 2 P.M., Dr. Simson: Diseases of Women.
TUESDAY.—11 A.M., Mr. Endean: Venereal Diseases. 12 noon, Dr. Burreh: Chest Cases. 2.30 P.M., Mr. Tyrrell Gray: Surgical Wards.
WEDNESDAY.—11 A.M., Medical Registrar: Medical Wards. 12.15 P.M., Dr. Burnford: Medical Pathology. 2 P.M., Dr. Pernet: Skin Dept.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 12 noon, Dr. Scott Pinchin: Diseases of the Heart. 2 P.M., Mr. MacDonald: Genito-Urinary Dept.
FRIDAY.—10 A.M., Dr. Drummond Robinson: Gynæcological Operations. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Dept.
SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy Dept. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, (Prince of Wales's General Hospital, Tottenham.)
(At 4.30 P.M.)
MONDAY, May 12th.—Mr. Aubrey Goodwin: Uterine Hæmorrhage.
TUESDAY.—Dr. J. Metcalfe: The Opaque Meal and its Interpretation.
WEDNESDAY.—Dr. J. Browning Alexander: Dyspepsia.
THURSDAY.—Mr. W. E. Tanner: Tuberculosis of the Mesenteric Glands in Children.
FRIDAY.—Mr. W. Ibbotson: The Essentials in Hearing and Equilibration Tests.

KING'S COLLEGE, Strand, W.C.
THURSDAY, May 15th.—5.30 P.M., Prof. T. H. Brice, F.R.S.: The Development of the Human Embryo (University of London Advanced Lectures in Anatomy).
FRIDAY.—5.30 P.M., Second Lecture.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, W.C.
POST-GRADUATE COURSE.
MONDAY, May 12th.—12 noon, Dr. Greenfield: The Cerebro-spinal Fluid. 2 P.M., Dr. Hinds Howell: Out-patient Clinic. 3.30 P.M., Dr. Kinnier Wilson. Lecture: Temporo-sphenoidal Epilepsy.
TUESDAY, May 13th.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Adie. Lecture: Muscular Atrophies.
THURSDAY, May 15th.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Walshe. Lecture: Clinical Disorders of Muscle Tone.
FRIDAY, May 16th.—2 P.M., Dr. Gordon Holmes: Out-patient Clinic. 3.30 P.M., Mr. Sargent. Lecture: Tumours of Ponto-cerebellar Angle.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.
THURSDAY, May 15th.—5 P.M., Mr. Richard Lake: Hearing Tests. (Geoffrey E. Duveen Lectures in Otology.)

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, May 15th.—4 P.M., Dr. Poynton: Acetonæmia associated with Volvulus of the Small Intestine.

ST. JOHN'S HOSPITAL, Leicester-square, W.C.
TUESDAY, May 13th.—5 P.M., Dr. Adamson: Affections of the Nails.
THURSDAY.—5 P.M., Dr. Griffith: Pemphigus and Bullous Eruptions.

UNIVERSITY OF LIVERPOOL POST-GRADUATE LECTURES. (At 3.30 P.M.)
MONDAY, May 12th.—(At the Children's Hospital.)
TUESDAY.—(At the Southern Hospital.) Mr. Nuttall: Ulcerative Colitis.
WEDNESDAY.—(At the Northern Hospital.) Mr. Monsarrat: Hæmaturia.
THURSDAY.—(At the Stanley Hospital.) Dr. A. G. Gullan: Encephalitis Lethargica.
FRIDAY.—(At the Royal Infirmary.) Mr. Kennon: Surgical Cases.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE LECTURES.
TUESDAY, May 13th.—4.15 P.M., Dr. J. Wharton: Ophthalmic Cases.

BRISTOL UNIVERSITY POST-GRADUATE DEMONSTRATIONS.
WEDNESDAY, May 14th.—3.30 P.M. (at the Hereford General Hospital), Mr. L. E. Claremont: Care and Treatment of Children's Mouths.

Appointments.

EAST, W. NORWOOD, M.D. Lond., M.R.C.S., L.R.C.P., has been appointed Medical Inspector, H.M. Prisons, England and Wales.

FAILL, C. J. C., F.R.C.P. Edin., L.R.C.S. Edin., L.R.F.P.S. Glasg., Chief Clinical Tuberculosis Officer, Leeds.

NIXON, H. C., M.D. Edin., Physician, Royal Mineral Water Hospital, Bath.

REA, S. P., M.B., B.S. R.U.I., Medical Officer for the Bangor Dispensary District.

WALKER, N., M.B., Ch.B. Manch., Assistant Medical Officer to the Out-patient Department, Royal Manchester Children's Hospital.

Certifying Surgeons under the Factory and Workshop Acts: ROSS, T. S. (Milborne Port District of Somerset); WILSON, J. T., M.B., Ch.B. Edin. (Dronfield); MANWARING-WHITE, R. M., M.D., Ch.B. Edin., F.R.C.S. Edin. (Northwich); and DONALD, H. C., M.B., Ch.M. Glasg. (Bishopton).

Manchester Royal Infirmary: ELLISON, B. L., M.B., Ch.B. Manch., Resident Medical Officer (Central Branch); HOGBEN, F. A., M.R.C.S., L.R.C.P. Lond., Assistant Medical Officer (Central Branch); COOK, B., M.B., Ch.B. Manch., Clinical Assistant; APPLETON, J. H., M.B., Ch.B. Manch., Senior House Surgeon.

Vacancies.

For further information refer to the advertisement columns.

Aberdeen Royal Infirmary.—Hon. Asst. Med. Electrician.
Aden Settlement.—Executive Health Officer. Rs.800 per mensem.
Belfast, Queen's University.—Lectureship in Anatomy.
Bradford Children's Hospital.—H.S. £1000.
Brentwood, Essex High Wood Hospital for Children.—Jun. Asst. M.O. £560.
Brighton, Hove Hospital, Sackville-road, Hove.—R.M.O. £150.
Cardiff, University College of South Wales, &c.—Prof. of Path. and Bact. £1500.
East Sussex County Mental Hospital, Hellingly.—Jun. Asst. M.O. £350.
Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—H.P., Obstetric Asst., and Two H.S.'s. Each £50. P. for Mechano-Therapeutic Dept.
Gt. Yarmouth Hospital.—H.S. £150.
Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—Radiologist £100.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Hon. Med. O. for X Ray and Electro-Therapeutics.
Hospital of St. John and St. Elizabeth, 40, Grove End-road, N.W.—Asst. Radiologist. £50.
King Edward VII. Sanatorium, Midhurst, Sussex.—Med. Sup. £1000.
Leicester Royal Infirmary.—Hon. P. and Asst. Hon. P.
Liverpool Hospital for Consumption and Dis. of Chest, Mount Pleasant.—Asst. M.O. and Pathologist. £150.
Liverpool, Royal Southern Hospital.—Hon. Gynæcologist and Hon. Asst. Orthop. S.
Liverpool, Walton Institution.—Res. Asst. M.O. £200.
London County Council Education Officers' Dept.—Woman Organiser of Physical Education. £696.
Loughborough and District General Hospital and Dispensary, 9, Leicester-road.—Res. H.S. £175.
Manchester, Ancoats Hospital.—H.S. £100.
Manchester Royal Eye Hospital.—H.S. Senior £150. Junior £120.
Margate, Princess Mary's Hospital for Children, Cliftonville.—Second A.M.O. £560.
Middlesex Hospital Medical School, W.—Two Cancer Research Scholarships. Each £150.
Middleton-in-Wharfedale, Sanatorium.—Asst. M.O. £500.
Miller General Hospital for South-East London, Greenwich-road, S.E.—H.S. £125.
Mines Dept., Dean Stanley-street, Millbank, S.W.—Temp. Medical Inspector. £1000.
National Hospital for the Paralysed and Epileptic, Queen-square, W.C.—Registrar. £200.
Newcastle-upon-Tyne, University of Durham College of Medicine.—Vacancy in Dept. of Bacteriology. £600.
Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—Cas. H.S. £100.
Queen Mary's Hospital for the East End, Stratford, E.—Hon. Asst. P.
Royal College of Surgeons of England.—Hunterian Professor and Arris and Gale Lecturer.
St. Giles Hospital, Camberwell, S.E.—Radiologist. £110.
Sheffield, Jessop Hospital for Women.—Hon. Physiologist. Hon. Asst. S. Also Asst. H.S. for Gynæcological and Maternity Depts. £100.
Sheffield Royal Hospital.—Cas. O. £150. Supt. and Secy.
Sheffield Royal Infirmary.—H.P. £60.
Union of South Africa Government Mental Hospital Service.—A.P.'s. £460.
Warrington County Borough.—Asst. M.O.H. £450.
West End Hospital for Nervous Diseases, Welbeck-street, W.—Half-time Pathologist. Also Locum Tenens for same post. Each £300. Also Radiologist.
West London Hospital, Hammersmith-road, W.—Med. Reg. £100.
Western Dispensary, 38, Rochester-row, Westminster, S.W.—Vacancy on Attending Medical Staff.
Wolverhampton and Midland Counties Eye Infirmary.—H.S. £200.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointment: Pickering, Yorks (North Riding).

Births, Marriages, and Deaths.

BIRTHS.

ATKIN.—On April 27th, at Fulwood-road, Sheffield, the wife of C. S. Atkin, M.B., of a son.

MARRIAGES.

COLBORNE—CUTBUSH.—On April 30th, at the Parish Church, Headcorn, Surgeon Lieutenant-Commander William John Colborne, R.N., to Florence Alice, youngest daughter of Mr. and Mrs. W. Cutbush, of Headcorn, Kent.

FAWDRY—MEARNS FRASER.—On April 29th, at Portsmouth Parish Church, John Wood Fawdry, *M.C.* (Captain, Royal Warwickshire Regiment), second son of the late A. G. Fawdry, Esq., and Mrs. Fawdry, Edgbaston, to Lois Mearns, younger daughter of Dr. and Mrs. A. Mearns Fraser, Southsea.

HICKS—ELLIS.—On April 22nd, at St. Mary Magdalene Church, Norwich, Ernest Wm. Hicks, M.R.C.S., L.R.C.P., to Cecilia Mary Susan, daughter of Rev. A. H. and Mrs. Ellis.

JOLL—WINSLOE.—On April 30th, at St. Mark's, North Audley-street, by the Rev. W. E. Pennyman, M.A., Cecil Augustus Joll, M.S. Lond., F.R.C.S. Eng., to Laura Merriall Winsloe.

SWAINE—PEGRUME.—On April 26th, at All Souls', Langham-place, Dr. Richard O. Swaine, of Christchurch, Hants, to Nancy Hillyard, youngest daughter of the late J. Pegrume and Mrs. Pegrume.

DEATHS.

GRAHAM.—On April 29th, at "Shoreside," Bolton-le-Sands, Dr. Charles Robert Graham, aged 67.

SPENCER.—On April 24th, at Tavistock, Devon, Dr. Edward Macready Spencer, of Cardiff, aged 58 years.

WYLIE.—On May 2nd, at Leicester, Angus Wyllie, M.A., M.B. Camb., of The Ropewalk, Nottingham.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

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For complete scale of advertisement charges apply to the Manager.

Notes, Comments, and Abstracts.

DIED IN HARNESS.

A STUDY OF THE SURGEONS' ROLL.

BY VICTOR G. PLARR,
LIBRARIAN AND COMPILER OF THE ROLL OF FELLOWS, ROYAL COLLEGE OF SURGEONS OF ENGLAND.

THE recent death at a comparatively early age of Sir Archibald Reid adds another name to the roll of martyrs to science. He had devoted himself to roentgenology and ultimately was the victim of the methods he had improved. But though science thus counts a number of martyrs in its ranks, duty, or mere professional routine, counts many more. On examining the lives of some 2000 or more medical men, Fellows of the Royal College of Surgeons, many of them general practitioners, we can count during a period of 80 years nearly as many men who may be said to have qualified as martyrs to the day's work. As long ago as 1847 John Phillips Potter, F.R.C.S., when assistant to the famous Liston, punctured a knuckle when taking a diseased hip-joint from a subject for dissection, and after acute suffering, heroically borne, died within three weeks of his accident and only five weeks of his appointment to the assistant surgeoncy of University College Hospital. He was a man of general culture and rare promise. Deaths due to operation wounds—punctures and cuts—or to infections have continued to occur even after the introduction of rubber gloves. Thus, taking the names in alphabetical order, we find that Dr. Andrew Clark died in 1913 of a bad cut received during one of his operations seven years earlier; Campbell Dykes died a victim to septicæmia, contracted while operating in October, 1911; Dr. Webb Jones accidentally inoculated himself when giving an intravenous injection to a colleague dying of typhus during the epidemic of that disease in Alexandria early in 1917. Operation infection also caused the death of Mr. Charles Killick, M.A. Camb., F.R.C.S., Dr. Henry Percy Potter, of Kensington, in 1917—a most pathetic case—and Dr. Arthur John Sharp, of Nottingham, in 1910. In some of these cases the hands may not have been properly gloved. None the less, these gentlemen were martyrs to duty, and to their goodly company might be added a list capable of indefinite extension of those who overworked themselves during many years, insisted on visiting patients when themselves very ill, or, in the recent war period, did the work of colleagues at the Front when themselves past work. Here it would be invidious to name names.

A curious list might be made of those who succumbed to their specialties, the diseases in which they were interested. Thus, in 1906, Kendall, of Bristol, died of an appendicitis operation after operating on a child whose appendix he removed. In 1889 Dr. David Reid McKinnon died combating a yellow fever epidemic, in which he had taken great interest, in British Honduras. John Henry Farbstein, resident medical officer of the Hull Workhouse, died of phthisis in 1911, having spent much time in the study of the disease in the consumption ward, and in 1888 Francis Stanhope Hawkins, an old Tonbridge School and Oxford man, died of diphtheria after clearing the tube in the throat of a child, presumably by the primitive method of suction. The case of that veteran friend of English surgery, Just Lucas-Championnière, may here be included. He died in 1913 of cerebral hæmorrhage while reading a paper at the Institut on ancient trephining and cerebral localisation. Sometimes a medical man is destroyed of malice prepense by an insane patient. Thus, to cite one instance of several, Samuel Pozzi, the great French gynæcologist, was shot dead in June, 1918, by a discontented melancholic patient on whom he had rightly refused to operate again. Another well-known case of a physician assasinated by a lunatic occurred in Australia not many years ago. With the foregoing instances we might rank those of the medical missionaries who fell victims to the diseases they were endeavouring to stamp out among their semi-civilised and unhealthy flocks. Among these the Chinese missionaries rank high. Dr. James Glenny Gibb, organiser of the Central Red Cross Society's work in the Chinese Revolution of the year 1912, died in the midst of his labours; Cecil Frederick Robertson, M.B., F.R.C.S., died of illness contracted among his out-patients in 1913; and, at about the same time, Dr. Herbert Stanley Jenkins, overwhelmed with work in the Sianfu (Shansi) Hospital, succumbed to fever. He was in his thirty-ninth year, and so great was the stress of duty unavoidably imposed upon him in the new mission hospital that he saw as many as 60 out-patients the day before he died. Out-of-the-way cases of death at the post of duty, not referable to any of the above categories, occur in the older medical biographies. Charles Aston Key, famous as an operator and pioneer anæsthetist, died greatly interested in his own case. His death from cholera, from which he only suffered for a few hours, occurred in 1849, during a historic epidemic in the City, and is minutely described, step by step, by his medical attendant, neither he nor Key having the slightest suspicion of the water-borne nature of the disease. It is a memorable document. In 1863 Charles Allen Chavasse, F.R.C.S., died in the very act of attending a patient in his surgery; Henry Work Dodd, F.R.C.S., met a similar fate in his consulting room in 1921; but perhaps the most remarkable tragedy occurred when an old surgeon of the past died at the very moment of delivering a mother of her child.

POISON GAS IN NAVAL WARFARE.

POISON gas is not usually associated with naval warfare, but that it has been so used is stated by Lieut. Paul W. Hains, of the Construction Corps, U.S.N., in a recent number of the *Naval Bulletin* of the U.S. Naval Medical Department. In a paper dealing with the protection of capital ships against poison gas, he instances the case of H.M.S. *Botha*, a flotilla leader, which in 1917 passed through a smoke screen into which the Germans had mixed poison gas. The ship was exposed for only about a minute, but "every man on her was thrown into paroxysms of nausea and suffered a most violent headache." The author wonders what would have happened if the Turks had discharged poison gas over and about the fleet lying off the Dardanelles. To prevent a ship being thus put out of action, protection of some kind must be given to the personnel, and the writer requires that every man shall have a mask, the effective filter being arranged on top of his head so as not to hamper his arm work, but an "optical" mask must be attached to sighting instruments, so that the gun-layer, for example, shall use his mask habitually at his work, and become thoroughly accustomed to it. Each man must also have a suit of protective clothing, suitably impregnated, to neutralise vesicants like mustard gas. The wearing of such equipment materially reduces efficiency and output of work, as the writer tells us he found when, wearing a gas mask, he tried to play baseball; he had even difficulty then in merely writing. As the sailor in action is called upon for the very hardest work of his life, some other method of protection must be sought; protection must be given to the air of the ship, not to the individual. Lieut. Hains thinks the best method will be to maintain a positive air pressure continuously within the ship by over-ventilation. Then offensive air from the outside cannot drift in; a good scheme, but we are not told whence is to come the uncontaminated air needed to keep up the pressure. However, the turrets are to be freed from hurtful gases by the "Seco" spray, which washes air, eliminating 95 per cent. of poisonous gases, and the conning tower and a reconstructed engine-room are to have a system of continuous purification by soda-lime, as used in submarines, removing carbonic acid and moisture, and oxygen is to be gradually added from cylinders. All these proposals mean increased weight to be carried by the ship, and so make her a little less effective; but the gas menace is urgent.

THE ROCKEFELLER FOUNDATION.

A REVIEW of the activities of the Rockefeller Foundation in 1923, written by George E. Vincent, its President, will shortly appear. Meanwhile, the Information Service of the Rockefeller Foundation has provided in a single breathless sentence a summary of the activities of the Foundation during the past year, which are amazing in their scope and generosity.

During the year 1923 the International Health Board, the China Medical Board, and the Division of Medical Education of the Rockefeller Foundation supplied Fellowship funds for 636 individuals in 29 different countries; supported through the League of Nations interchange institutes for 54 public health officers from 27 nations; arranged international visits of one commission and of 24 visiting professors; furnished emergency relief in the form of medical literature or laboratory equipment and supplies to institutions in 15 European countries; sent scientific material to Japan after the earthquake and invited a group of Japanese medical scientists to use the laboratories of the Peking Union Medical College as guests of the institution; continued to contribute to schools or institutes of hygiene at Harvard, London, Prague, Warsaw, and São Paulo, Brazil; coöperated in nurse training at Yale University and in France, Belgium, Brazil, China, and the Philippines; accepted an invitation from Brazil to participate in a comprehensive attack upon yellow fever; had a share in demonstrations of malaria control in 12 American States, and conducted malaria surveys or studies in the United States, Brazil, Australia, Nicaragua, Porto Rico, Salvador, the Philippine Islands, and Palestine; either continued or began anti-hookworm work in conjunction with 20 Governments in various parts of the world; contributed to 183 county health organisations in

the United States, New Brunswick (Canada), and Brazil; continued a study of the medical schools of the world by visits to Belgium, Austria, Czecho-Slovakia, Germany, Hungary, Poland, Turkey, Hong-Kong, the Straits Settlements, Siam, Canada, England, Scotland, Wales, the Netherlands, Mexico, and Colombia; offered to contribute £280,750 sterling to the development of medical education in certain universities in the British Isles; gave $500,000 to the University of Alberta, and pledged $250,000 to the University of Pennsylvania toward buildings for anatomy and physiological chemistry; continued to support a modern medical school and teaching hospital in Peking; aided two other medical schools and 25 hospitals in China; assisted pre-medical education in several institutions in China and agreed to do this also in Bangkok, Siam; lent representatives to Governments and institutions for various types of counsel and service; continued to support a disease reporting service of the Health Section of the League of Nations; contributed to mental hygiene projects, demonstrations in dispensary administration, organisation of dispensary work in France, and to other undertakings in the fields of public health and medical education.

Expenditure in 1923.

The following table presents a summary of the expenditure in various fields during 1923:—

Public Health.	
International Health Board—hookworm disease, malaria, yellow fever, county health work, laboratory service, Fellowships, &c.	$2,332,511
Mental hygiene	52,153
Hospital, dispensary, and nursing studies	161,504
School of Public Health, Harvard University	618,750
National Health Council	9,350
Medical Education.	
China Medical Board	1,354,942
Canadian Medical Programme	1,596,592
London Medical Centre	621,472
University of Chicago	1,046,952
Columbia University	8,333
Central Europe—journals and apparatus	60,316
Pasteur Institute	20,000
Fellowships, studies, &c.	202,403
Miscellaneous.	
Concluding payments on ten-year pledges to educational enterprises	37,500
Concilium Bibliographicum, Zürich	20,000
Fellowships in physics, chemistry, and the biological sciences	97,428
National Information Bureau	1,000
Administration.	
Executive offices	189,869
Total	$8,431,075

The record requires little comment. Those who have experience of the care taken by this giant organisation to investigate the claims made upon its benevolence know that the percentage of wasted money or effort is reduced to a minimum, while no reasonable scheme for developing research or education or promoting health in any part of the world is refused consideration.

COLONIAL HEALTH REPORTS.

Bahamas.

THE estimated population on Jan. 1st, 1923, was 56,924. The birth-rate in 1922 was 31 per 1000 and the death-rate 25·2 per 1000. The Bahamas General Hospital (originally established in 1809 as a poor-house) comprises the hospital proper, a paying patients' ward, infirmary, dispensary, lunatic asylum, and leper wards. The number of inmates on Dec. 31st was: Alexandra Hospital, 76; Victoria Jubilee Infirmary, 37; lunatic asylum, 46; leper asylum, 8. During the year there had been 955 admissions, making a total under treatment of 1105. There were 148 surgical operations performed under a general anæsthetic in the Alexandra Hospital; 4252 cases were prescribed for or treated for minor surgical ailments at the out-patients' (or dispensary) department. At the public dispensary 17,324 prescriptions were dispensed.

St. Vincent.

The population of this colony was estimated by the Registrar-General on Dec. 31st, 1922, to be 46,220. In 1922 the birth-rate was 36·37 and the death-rate 21·31 per 1000. Of the total number of births 71·1 per cent. were illegitimate. The general health was good. There was a mild epidemic of measles, and infantile diarrhœa continued to be prevalent. The campaign against yaws by intramuscular injection of novarsenobillon was pressed vigorously with very satisfactory results. During the year 4604 cases—over 10 per cent. of the population—were treated and of these over 78 per cent. were returned as cured. The temperature throughout the year varied from 76·20° to 80·8° F. The total rainfall for the year was 79·74 inches.

PROPOSED VISIT OF SPANISH MEDICAL MEN TO THE BRITISH EMPIRE EXHIBITION.

To the Editor of THE LANCET.

SIR,—On the occasion of the celebration of the great British Empire Exhibition it is our desire to organise a mission of Spanish University professors and medical and scientific men with a view to making a visit to this exhibition. At the same time we should like to avail ourselves of the opportunity to hold conferences, discuss scientific affairs, and visit the institutions, hospitals, and so forth in the United Kingdom, and thus help to tighten the bonds already uniting the men of science of Great Britain with their brothers of the Iberian Peninsula. In order, however, to organise such an expedition in a fitting manner it is essential that we should have the support and assistance of our British colleagues.

I am, Sir, yours faithfully,

DOCTOR CARLES,
Editor, Laboratorio, Revista de Ciencias Biológicas y de Medicina Experimental, Pelayo 24, Barcelona.

April 30th, 1924.

THE NURSE'S INTEREST IN HER WORK.

To the Editor of THE LANCET.

SIR,—At least one institution for hospital nurses for private cases advertises the fact that its nurses return at intervals to the wards of the hospital between their private cases, and I should like, if I may, to call attention to the extreme importance of this, not only for keeping the nurses' training fresh and up to date, but also for the general good of everyone concerned. Efficient nurses who are keen at their work must inevitably find many private cases, with their usually prolonged periods of convalescence, dull and uninteresting, and it is well known that private nurses often long for the variety and constant urgency which is only obtainable in a hospital ward, and usually the better the nurse the more frequently this feeling occurs. If it were the universal custom for private nurses to return for fixed periods to the wards of a hospital they would not only keep their knowledge fresh, but the comparative monotony of many private cases would be a relief and not merely a period of dull inactivity. Such matters of applied psychology are far more important than they appear.

I am, Sir, yours faithfully,

May 4th, 1924. CYRIL BRUYN ANDREWS.

SEAMLESS BIAS BANDAGES.

THESE bandages are made of a muslin-like fabric, soft in texture, and cut "on the cross." The elasticity of the fabric allows it to confotm to the contour of the limbs or body and there is little or no chance of the bandage slipping out of place, while, in tension, the threads of which it is composed are drawn closer together. Where a thin and porous bandage with firm pressure is required this invention should prove useful. The makers are the Seamless Bias Manufacturing Company, of Newark, N.J., and the European agent Mr. A. H. E. Bercham, M.I.M.E., 3, Casewick-road, West Norwood, London, S.E. 27.

MALARIA SIMULATING THE "ACUTE ABDOMEN."

THAT chameleon, malaria, furnishes many difficulties of diagnosis to practitioners in hot countries. It may, e.g., simulate cholera or dysentery (THE LANCET, 1920, ii., 1334). Another remarkable case is described in the *Arch. f. Schiffs- u. Tropen-Hygiene* (vol. xxviii., 2) by Dr. O. Urchs, whom it nearly misled. He was taking medical charge of miners at Moengo, in Dutch Guiana, when he was called out one night to see a young Japanese, usually in good health except for attacks of fever, but now suddenly taken ill with rigors (temp. 103° F.), severe shock, and extreme pain in the belly; he was a picture of misery, groaning all the time, both hands always pressed against the abdomen. The belly was hard as a board, any movement increased the pain, which seemed to be at its worst 2½ inches below the right costal margin. Patient was constipated and had been vomiting, so it appeared that a laparotomy might be necessary. But when better lighting was obtained, there showed up, in spite of the tension of the abdominal wall, a swelling filling the left hypochondrium, and extending to the navel, painful, and most particularly tender along its edge. This was recognised as an acute malarial swelling of the spleen, which causes great pain by the sudden stretching of capsule, mesentery, and ligaments. With injection of 15 gr. of quinine, cold compresses, and the like, the pain ceased during the night, and next day urobilin was found in the urine, tertian parasites in the blood, and the blood picture proved this attack to have been a relapse.